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U.S. Department
of Transportation

**National Highway
Traffic Safety
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DOT HS 807 773 **October 1990**
Final Report

Final Report of 270^0 Contoured Moving Barrier Impact Into a 1984 Audi 5000 4-Door Sedan in Support of Crash III Damage Algorithm Reformation

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INTO A 1984 AUDI 5000 4-DOOR SEDAN IN
SUPPORT OF CRASH III DAMAGE ALGORITHM REFORMATION

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N.A. El-Habash, Project Engineer, TRC

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15. Supplementary Notes

16. Abstract

Four 270° contoured moving barrier impact tests were conducted for research and development in support of the crash III damage algorithm reformulation. These tests were conducted on a 1984 Audi 5000 4-door sedan, VIN WAUFB0444EN099818, at the Transportation Research Center of Ohio. The following four tests were conducted on the vehicle:

TEST NO.	DATE	TIME	SPEED (mph)	MAXIMUM CUMULATIVE CRUSH (in.)
900924-1	9/24/90	1108	15.2	5.9
900924-2	9/24/90	1446	20.1	10.7
900925-1	9/25/90	936	20.0	16.8
900925-2	9/25/90	1139	40.1	32.4

17. Key Words

270° Contoured Moving Barrier Impact
Crash III Damage Algorithm
Reformulation.

18. Distribution Statement

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TABLE OF CONTENTS

SECTION	TITLE	PAGE
1.0	PURPOSE AND TEST SUMMMARY	1-1
2.0	VEHICLE AND TEST DATA	2-1
3.0	TEST #900924-1 SUMMARY	3-1
4.0	TEST #900924-2 SUMMARY	4-1
5.0	TEST #900925-1 SUMMARY	5-1
6.0	TEST #900925-2 SUMMARY	6-1
APPENDIX A	PHOTOGRAPHS	A-1
APPENDIX B	DATA PLOTS	B-1
APPENDIX C	MISCELLANEOUS TEST INFORMATION	C-1

SECTION 1.0

PURPOSE AND TEST SUMMARY

The purpose of the four 270° contoured moving barrier impact tests was for research and development in support of the CRASH III damage algorithm reformulation.

The 1984 Audi 5000 was equipped with a 2.2 liter, 5-cylinder, inline, gas engine with a 3-speed automatic transmission. The intended total test weight of the vehicle was 2726 pounds. The actual weight was 2720 pounds.

The contoured moving barrier actual weight was 2726 pounds, frontal width was 67.0 inches, barrier height was 31.5 inches, bumper width was 6.0 inches and height of the bumper centerline was 17.5 inches. The contoured moving barrier was intended to impact the driver's side of the vehicle at 270°. The leading edge of the contact was to be 22.5 inches forward of the vehicle's center of gravity.

The test vehicle was equipped with center of gravity accelerometers oriented to measure vehicle X and Y-axis accelerations and right front and rear sill accelerometers oriented to measure vehicle Y-axis accelerations.

The moving barrier (impactor) was equipped with center of gravity accelerometers oriented to measure X and Y-axis accelerations.

The crash test event was recorded by two (2) high speed motion picture cameras.

SECTION 2.0

VEHICLE INFORMATION

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Audi NSU Auto Union AG

MAKE/MODEL: Audi 5000 VIN: WAUFB0444EN099818

BODY STYLE: 4-door sedan MODEL YEAR: 1984

NHTSA NO.: NA COLOR: Gold

ENGINE DATA: TYPE: inline CYLINDERS: 5 DISPLACEMENT: 2.2 liter

TRANSMISSION DATA: _3_SPEED, ___MANUAL, _X_AUTOMATIC, _X_FWD, ___RWD, ___4WD

DATE VEHICLE RECEIVED: NA ODOMETER READING: 41,871

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	Yes
POWER SEATS	Yes	TILTING STEERING WHEEL	No
POWER WINDOWS	Yes	TELESCOPING STEERING WHEEL	No
TINTED GLASS	Yes	AIR CONDITIONING	Yes
RADIO	Yes	ANTI-SKID BRAKE	No
CLOCK	No	REAR WINDOW DEFROSTER	Yes
OTHER	None		

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? Yes
2. DOES VEHICLE SHOW EVIDENCE OF PRIOR ACCIDENT HISTORY? No
3. DOES VEHICLE SHOW ANY SIGNIFICANT CORROSION? No
4. CONDITION OF THE FRONT/REAR BUMPER AND FRAME: Good

CERTIFICATION DATA FROM VEHICLE'S LABEL:

VEHICLE MANUFACTURED BY: Audi NSU Auto Union AG

DATE OF MANUFACTURE: 1/84 VIN: WAUFB0444EN099818

GVWR: 3946 LBS

GAWR: FRONT: 2194 LBS., REAR: 2028 LBS.

TEST VEHICLE INFORMATION CONT'D

TIRES ON VEHICLE (MFR., LINE, SIZE): Continental Contact P185/70R14

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 36 PSI
REAR: 36 PSI

SPARE TIRE (MFR., LINE, SIZE): T115/70D15 Continental

TYPE OF SEATS: FRONT: Buckets
REAR: Bench

TYPE OF FRONT SEAT BACKS: Manually adjustable

MAXIMUM WIDTH: 71.5 INCHES

WHEELBASE: 105.5 INCHES

LOCATION OF LABEL STATING TIRE & CAPACITY DATA: *

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL: *

RECOMMENDED TIRE SIZE:

RECOMMENDED COLD TIRE PRESSURE: FRONT: PSI; REAR: PSI

DESIGNATED SEATING CAPACITY: ___FRONT ___REAR ___TOTAL

VEHICLE CAPACITY WEIGHT: _______ LBS.

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN INCHES):

DELIVERED ATTITUDE: LF 27.1 ;RF 26.9 ;LR 25.9 ;RR 25.6

PRE-TEST ATTITUDE: LF 25.9 ;RF 26.8 ;LR 25.0 ;RR 25.3

*THE VEHICLE DID NOT CONTAIN TIRE AND CAPACITY LABEL.

TEST VEHICLE INFORMATION CONT'D

WEIGHT OF TEST VEHICLE AS RECEIVED (EMPTY FLUIDS):

RIGHT FRONT	950 LBS.	RIGHT REAR	471 LBS.
LEFT FRONT	853 LBS.	LEFT REAR	551 LBS.
TOTAL FRONT WEIGHT	1803 LBS.	(63.8% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	1022 LBS.	(36.2% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	2825 LBS.		

TEST VEHICLE'S TARGET TEST WEIGHT: *

TARGET TEST WEIGHT = 2726 LBS

WEIGHT OF TEST VEHICLE:

RIGHT FRONT	917 LBS.	RIGHT REAR	447 LBS.
LEFT FRONT	840 LBS.	LEFT REAR	516 LBS.
TOTAL FRONT WEIGHT	1757 LBS.	(64.6% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	963 LBS.	(35.4% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	2720 LBS.	(0.2% UNDER TARGET TEST WEIGHT)	

WEIGHT OF BALLAST SECURED IN VEHICLE: None LBS.

COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: Exhaust, rear seat and battery.

CG = 37.4 INCHES REARWARD OF FRONT WHEEL CENTERLINE

*Target test weight was established as the weight of the unballasted moving barrier with the contoured barrier face.

VEHICLE FRONT CRUSH MEASUREMENTS AT VEHICLE BUMPER HEIGHT (20.5 INCHES)

LOCATION	0		1		2		3		4		5		6		7		8	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	13.6	18.4	13.4	20.9	12.7	23.9	12.1	26.9	11.8	29.8	11.2	32.7	10.8	35.8	10.4	38.8	10.1	41.8
POST-TEST 1	13.8	16.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	15.1	13.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 3	18.6	14.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 4	30.8	15.5	29.3	17.8	27.5	20.4	26.0	23.0	24.6	25.8	23.5	28.3	22.0	31.1	21.1	33.8	19.6	36.6

LOCATION	9		10		11		12		13		14		15		16		17	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	9.9	44.7	9.5	47.7	9.6	50.6	9.9	53.7	10.1	56.7	10.5	59.7	10.9	62.8	11.3	65.8	11.8	68.8
POST-TEST 1	NA	NA	8.3	46.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	NA	NA	9.5	43.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 3	NA	NA	11.5	44.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 4	18.8	39.4	17.2	42.1	16.6	45.0	15.8	48.1	15.6	50.9	14.6	53.9	14.5	56.9	14.1	60.0	13.6	63.0

LOCATION	18		19		20		21		22		23		24		25		26	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	12.4	71.8	12.8	74.8	13.2	77.6	14.6	80.2	17.5	81.4	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 1	NA	NA	NA	NA	7.9	76.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	NA	NA	NA	NA	12.0	73.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 3	NA	NA	NA	NA	14.3	74.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 4	12.9	66.0	12.6	69.0	12.4	71.8	13.1	74.7	15.4	76.4	NA	NA	NA	NA	NA	NA	NA	NA

All measurements are in inches. Column readings are three inches apart from left to right on vehicle.
All X-axis measurements taken from a reference plane 200 inches from and parallel to the rear bumper.
All Y-axis measurements taken from a reference plane 48 inches from and parallel to the vehicle longitudinal centerline.
Post-test 4 Y-axis measurements taken from a reference plane 72 inches from and parallel to the vehicle longitudinal centerline.

LEFT SIDE CRUSH MEASUREMENTS AT MOVING BARRIER BUMPER HEIGHT (17.5 INCHES)

LOCATION	1		2		3		4		5		6		7		8		9	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	16.1	17.1	19.4	16.5	22.2	16.1	25.3	15.9	28.3	15.6	31.2	15.2	34.2	14.8	36.9	14.2	40.1	15.0
POST-TEST 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	41.6	14.0
POST-TEST 2	19.0	13.4	21.9	13.2	25.1	12.9	28.1	12.8	31.1	12.8	34.1	12.5	36.9	12.5	40.2	12.0	43.4	12.9
POST-TEST 3	21.3	13.8	24.3	13.5	27.4	13.5	30.2	13.5	35.6	13.6	36.1	13.6	39.4	13.2	42.2	13.9	46.4	15.2
POST-TEST 4	33.5	15.2	36.4	15.5	41.9	20.0	45.4	21.2	47.8	22.3	50.1	23.4	53.2	24.8	55.8	26.0	58.1	28.9

LOCATION	10		11		12		13		14		15		16		17		18	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	42.8	14.9	45.8	14.5	48.9	14.5	51.8	14.3	54.9	14.2	57.8	14.1	61.0	13.9	64.6	14.2	67.5	14.2
POST-TEST 1	44.6	13.7	47.6	13.6	50.5	13.7	53.7	13.8	56.7	14.0	59.6	14.3	62.8	15.3	65.6	17.9	68.1	19.1
POST-TEST 2	46.2	12.9	49.2	13.2	52.2	13.8	55.4	14.3	58.2	14.7	60.9	16.0	64.1	18.4	67.1	21.2	68.5	23.3
POST-TEST 3	48.9	16.0	51.6	16.8	54.9	17.5	57.9	18.2	60.4	20.0	63.4	21.1	65.8	24.0	65.9	37.6	70.1	39.8
POST-TEST 4	57.3	31.4	61.9	33.9	63.6	36.2	64.2	38.6	66.2	41.1	67.8	44.0	71.1	48.5	72.1	54.3	72.3	56.0

LOCATION	19		20		21		22		23		24		25		26		27	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	70.5	14.3	73.6	14.1	76.7	14.2	79.5	14.2	82.5	14.2	85.6	14.1	88.8	14.1	91.7	14.1	94.6	14.0
POST-TEST 1	71.1	19.1	75.0	19.7	78.1	19.9	81.1	20.1	84.2	20.1	87.2	20.1	90.2	20.1	93.0	19.9	96.0	20.0
POST-TEST 2	71.2	24.2	75.5	24.5	78.4	24.8	81.6	24.9	84.6	24.9	87.8	24.8	90.8	24.8	93.8	24.7	96.7	24.5
POST-TEST 3	72.7	31.3	76.8	31.5	79.8	31.6	82.8	31.5	85.8	31.5	88.5	31.3	91.8	31.1	94.5	31.0	97.4	30.9
POST-TEST 4	71.4	57.5	75.6	60.9	79.1	61.2	81.9	61.3	83.9	61.5	87.4	61.4	91.4	61.2	94.8	61.5	98.8	61.5

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.
All X-axis measurements taken from a reference plane 200 inches from and parallel to the rear bumper.
All Y-axis measurements taken from a reference plane 48 inches from and parallel to the vehicle longitudinal centerline.
Post-test 4 Y-axis measurements taken from a reference plane 72 inches from and parallel to the vehicle longitudinal centerline.

LEFT SIDE CRUSH MEASUREMENTS AT MOVING BARRIER BUMPER HEIGHT (17.5 INCHES)

LOCATION	28		29		30		31		32		33		34		35		36	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	97.7	14.0	100.6	14.0	103.2	14.0	106.1	14.2	109.5	14.1	112.5	14.1	115.4	14.2	118.5	14.2	121.5	14.3
POST-TEST 1	99.0	19.9	101.9	19.2	104.8	19.8	108.0	19.8	111.1	19.6	114.0	19.6	117.0	19.8	119.5	19.9	122.4	19.9
POST-TEST 2	99.8	24.6	102.9	24.6	105.5	24.5	108.6	24.4	111.8	24.2	114.9	24.4	117.9	24.4	120.9	24.6	123.8	24.8
POST-TEST 3	100.4	31.0	103.6	30.8	106.5	30.8	109.4	30.5	112.5	30.5	115.4	30.5	118.6	60.5	121.8	30.8	124.6	31.0
POST-TEST 4	101.5	62.0	104.9	62.4	107.0	62.7	109.5	62.9	112.8	63.2	116.9	63.8	119.7	64.4	122.5	65.0	125.9	65.6

LOCATION	37		38		39		40		41		42		43		44		45	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	124.4	14.3	127.5	14.5	130.4	14.5	133.5	14.6	137.5	14.6	139.7	14.8	142.5	14.8	144.8	14.5	147.4	14.3
POST-TEST 1	125.8	19.9	128.9	20.0	131.5	19.4	134.2	18.1	137.0	16.9	140.0	15.8	143.0	15.0	146.2	13.8	149.3	14.5
POST-TEST 2	126.7	24.9	129.7	24.9	132.6	24.8	134.6	22.8	136.8	20.5	138.9	18.6	141.9	15.9	146.2	15.6	149.0	15.3
POST-TEST 3	127.6	30.8	130.7	31.2	133.5	31.2	136.2	30.1	138.0	28.0	138.4	24.9	141.2	19.2	145.8	18.2	148.6	18.0
POST-TEST 4	128.4	66.1	130.4	66.7	135.0	67.4	138.5	66.9	138.2	65.8	137.2	63.2	138.3	49.6	145.3	47.2	147.4	45.9

LOCATION	46		47		48		49		50		51		52		53		54	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	150.2	14.3	153.9	14.4	156.8	14.7	159.7	14.8	162.8	14.9	166.2	14.4	169.8	15.8	172.8	15.6	175.4	15.6
POST-TEST 1	152.2	14.6	155.2	14.6	158.2	14.7	161.1	14.9	164.1	15.1	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	151.2	15.9	154.9	15.1	157.8	15.0	160.6	15.1	163.5	15.2	167.5	14.4	170.2	15.4	173.4	15.4	176.5	15.4
POST-TEST 3	151.6	17.4	154.5	17.2	157.2	17.1	160.4	17.0	163.5	16.8	167.5	15.9	170.4	17.9	173.4	16.4	179.6	16.9
POST-TEST 4	150.9	44.9	153.3	44.0	156.9	43.1	157.8	42.2	161.4	41.3	166.0	38.6	169.5	39.6	172.0	40.1	175.1	40.5

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.
All X-axis measurements taken from a reference plane 200 inches from and parallel to the rear bumper.
All Y-axis measurements taken from a reference plane 48 inches from and parallel to the vehicle longitudinal centerline.
Post-test 4 Y-axis measurements taken from a reference plane 72 inches from and parallel to the vehicle longitudinal centerline.

LEFT SIDE CRUSH MEASUREMENTS AT MOVING BARRIER BUMPER HEIGHT (17.5 INCHES)

LOCATION	55		56		57		58		59		60		61		62		63	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	178.4	16.2	181.1	16.2	184.1	16.4	187.1	16.9	190.1	17.3	193.1	17.5	195.8	18.0	200.0	78.0	NA	NA
POST-TEST 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	197.1	17.8	200.1	78.0	NA	NA
POST-TEST 2	179.4	15.8	182.4	16.0	185.4	16.4	188.3	16.5	191.1	16.8	194.1	17.2	197.1	17.6	200.0	78.2	NA	NA
POST-TEST 3	179.4	17.2	182.2	17.4	185.1	17.6	188.0	17.9	191.1	18.1	194.1	18.2	196.9	18.4	200.0	78.8	NA	NA
POST-TEST 4	178.1	40.5	181.1	40.6	184.6	40.8	188.3	41.1	189.5	41.2	192.8	41.8	195.6	42.0	200.0	101.5	NA	NA

LOCATION	63		64		65	
	X	Y	X	Y	X	Y
PRE-TEST	NA	NA	NA	NA	NA	NA
POST-TEST 1	NA	NA	NA	NA	NA	NA
POST-TEST 2	NA	NA	NA	NA	NA	NA
POST-TEST 3	NA	NA	NA	NA	NA	NA
POST-TEST 4	NA	NA	NA	NA	NA	NA

#61 LEFT REAR CORNER
#62 RIGHT REAR CORNER

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.
All X-axis measurements taken from a reference plane 200 inches from and parallel to the rear bumper.
All Y-axis measurements taken from a reference plane 48 inches from and parallel to the vehicle longitudinal centerline.
Post-test 4 Y-axis measurements taken from a reference plane 72 inches from and parallel to the vehicle longitudinal centerline.

LEFT SIDE CRUSH MEASUREMENTS AT VEHICLE SILL HEIGHT (11.5 INCHES)

LOCATION	1		2		3		4		5		6		7		8		9	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

LOCATION	10		11		12		13		14		15		16		17		18	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	67.8	16.9
POST-TEST 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	70.8	22.0
POST-TEST 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73.1	29.8
POST-TEST 4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	72.2	56.0

LOCATION	19		20		21		22		23		24		25		26		27	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	70.8	17.0	73.9	16.9	76.8	17.0	79.9	16.9	82.9	16.9	85.9	16.9	88.9	16.8	91.8	16.8	94.8	16.9
POST-TEST 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	73.5	23.2	76.5	24.0	79.1	24.0	81.9	23.8	84.8	23.8	88.0	23.8	90.9	23.9	93.8	24.0	96.6	24.2
POST-TEST 3	74.0	30.5	77.0	31.2	79.7	31.0	82.8	30.5	89.6	30.4	88.6	30.2	91.7	30.0	94.4	30.2	97.6	30.0
POST-TEST 4	75.3	58.5	77.4	62.4	80.4	62.8	83.9	62.3	87.8	62.2	90.9	62.2	93.6	62.2	96.8	62.2	97.7	62.5

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.
All X-axis measurements taken from a reference plane 200 inches from and parallel to the rear bumper.
All Y-axis measurements taken from a reference plane 48 inches from and parallel to the vehicle longitudinal centerline.
Post-test 4 Y-axis measurements taken from a reference plane 72 inches from and parallel to the vehicle longitudinal centerline.

LEFT SIDE CRUSH MEASUREMENTS AT VEHICLE SILL HEIGHT (11.5 INCHES)

LOCATION	28		29		30		31		32		33		34		35		36	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	97.9	16.9	101.0	16.9	103.9	16.9	106.9	16.9	109.9	16.9	112.9	16.9	115.9	16.9	118.8	17.0	121.9	16.9
POST-TEST 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	99.8	24.0	102.5	24.1	105.5	24.2	108.4	24.2	111.6	24.4	114.2	25.5	116.4	24.6	119.4	25.8	122.3	22.8
POST-TEST 3	100.5	30.0	103.5	30.1	106.6	30.2	109.4	30.4	112.2	31.0	114.6	30.4	116.3	30.5	119.2	29.9	121.9	28.2
POST-TEST 4	103.2	62.8	106.2	63.1	108.8	63.3	111.3	63.5	114.4	64.0	116.5	64.8	118.8	63.4	122.8	63.4	125.5	62.7

LOCATION	37		38		39		40		41		42		43		44		45	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	124.9	17.0	127.9	17.2	130.9	17.1	133.9	17.4	136.9	17.3	139.9	17.4	NA	NA	NA	NA	NA	NA
POST-TEST 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	125.1	20.2	128.0	20.4	130.9	20.5	134.0	19.8	137.0	19.4	139.6	18.4	NA	NA	NA	NA	NA	NA
POST-TEST 3	125.4	26.2	127.9	25.8	130.6	25.2	133.6	23.9	136.4	23.1	138.9	21.5	NA	NA	NA	NA	NA	NA
POST-TEST 4	127.2	62.2	129.5	61.8	131.8	61.1	136.1	60.0	138.4	57.1	138.4	53.5	NA	NA	NA	NA	NA	NA

LOCATION	46		47		48		49		50		51		52		53		54	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.
All X-axis measurements taken from a reference plane 200 inches from and parallel to the rear bumper.
All Y-axis measurements taken from a reference plane 48 inches from and parallel to the vehicle longitudinal centerline.
Post-test 4 Y-axis measurements taken from a reference plane 72 inches from and parallel to the vehicle longitudinal centerline.

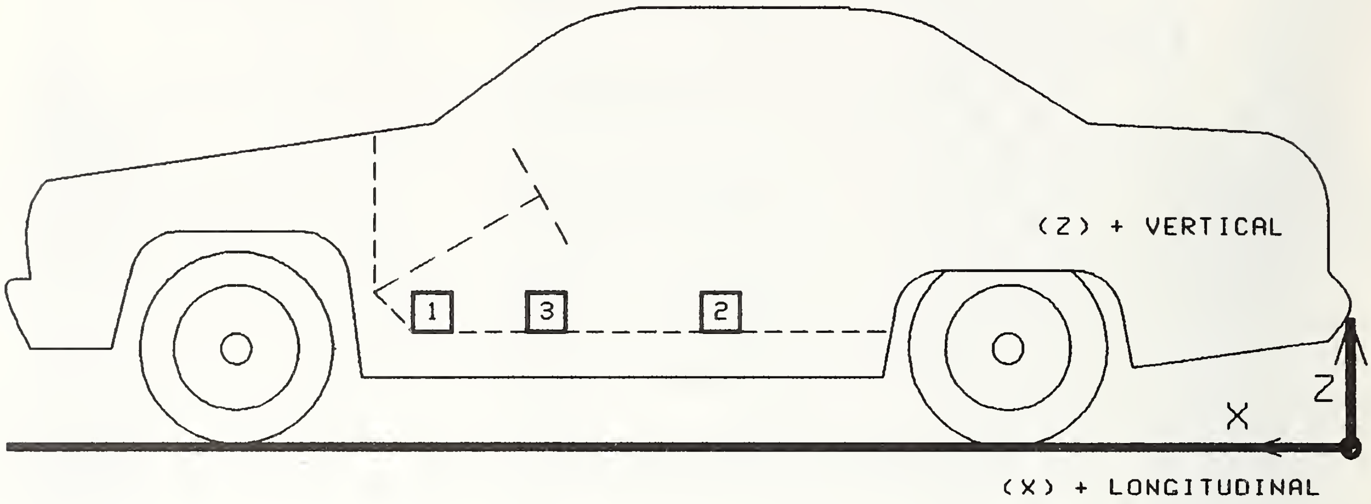
LEFT SIDE CRUSH MEASUREMENTS AT VEHICLE SILL HEIGHT (11.5 INCHES)

LOCATION	55		56		57		58		59		60		61		62		63	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

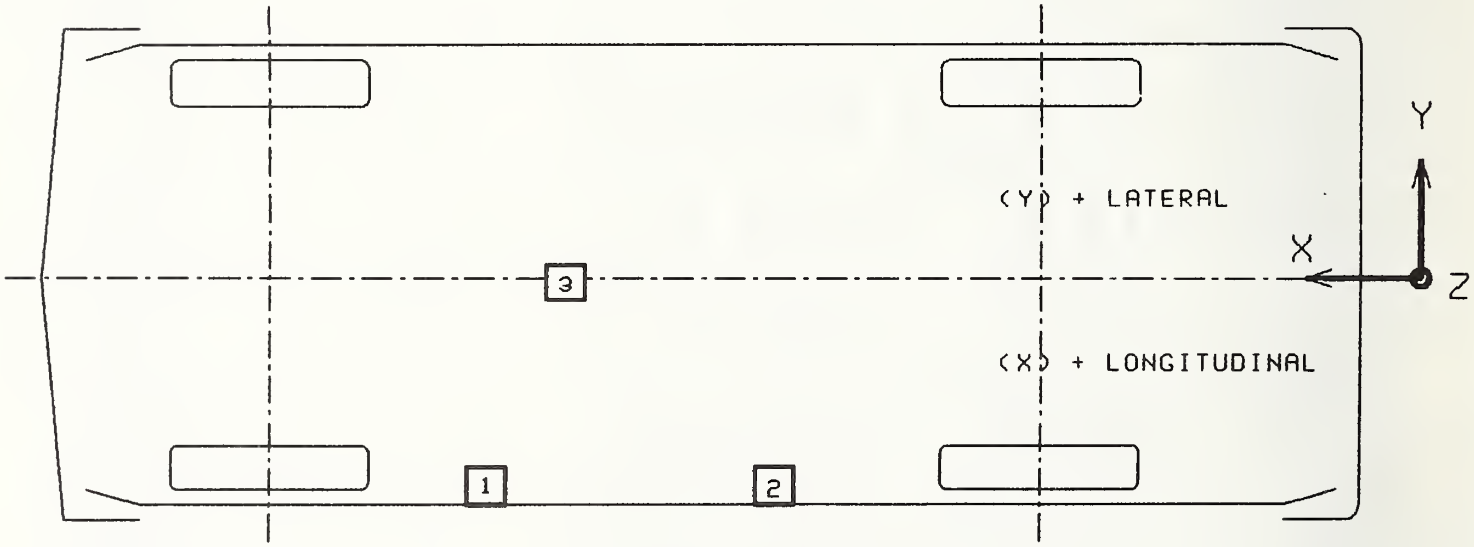
LOCATION	64		65		66	
	X	Y	X	Y	X	Y
PRE-TEST	NA	NA	NA	NA	NA	NA
POST-TEST 1	NA	NA	NA	NA	NA	NA
POST-TEST 2	NA	NA	NA	NA	NA	NA
POST-TEST 3	NA	NA	NA	NA	NA	NA
POST-TEST 4	NA	NA	NA	NA	NA	NA

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.
All X-axis measurements taken from a reference plane 200 inches from and parallel to the rear bumper.
All Y-axis measurements taken from a reference plane 48 inches from and parallel to the vehicle longitudinal centerline.
Post-test 4 Y-axis measurements taken from a reference plane 72 inches from and parallel to the vehicle longitudinal centerline.

VEHICLE ACCELEROMETER PLACEMENT

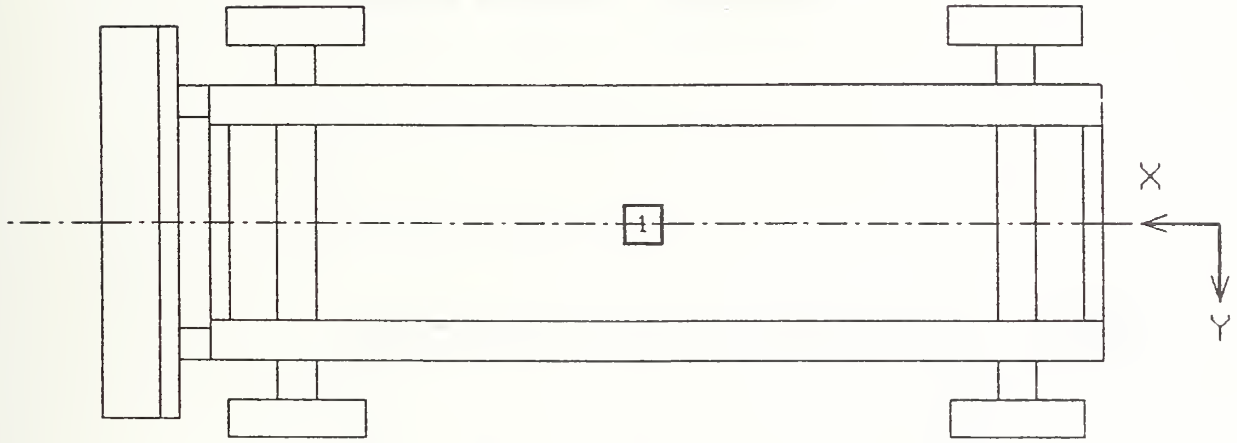


SIDE VIEW

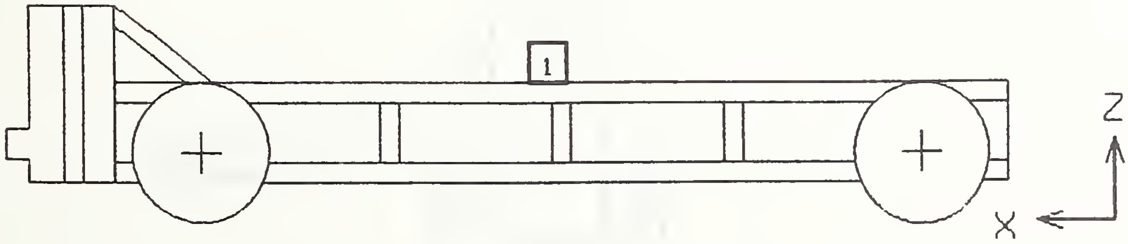


BOTTOM VIEW

MOVING BARRIER
ACCELEROMETER PLACEMENT

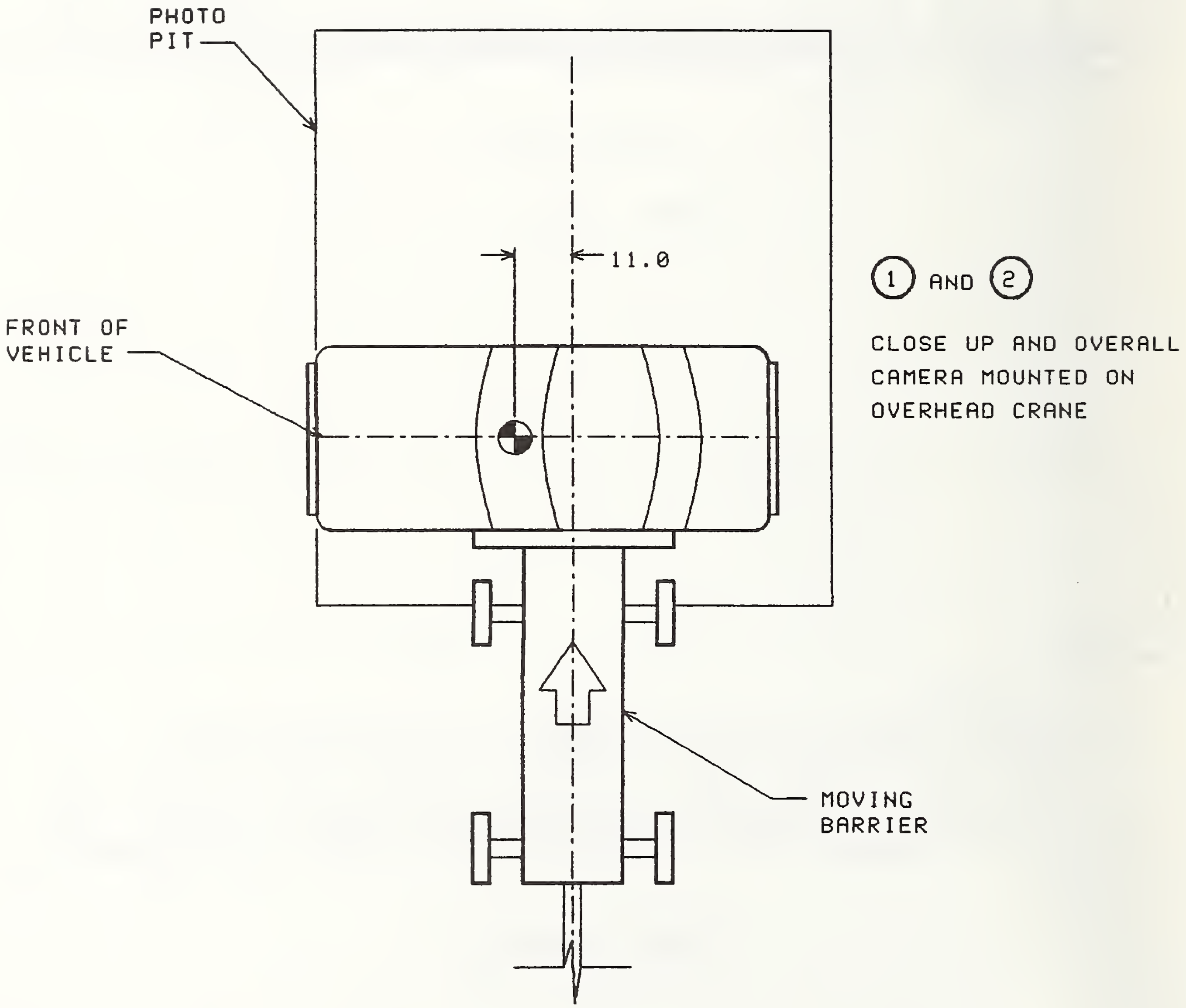


TOP VIEW



SIDE VIEW

CAMERA POSITIONS



SECTION 3.0

TEST 900924-1 SUMMARY

TEST CONDITIONS

TEST NUMBER: 900924-1

DATE OF TEST: 9/24/90

TIME OF TEST: 1108

AMBIENT TEMPERATURE AT IMPACT AREA:	65° F
INTENDED MOVING BARRIER VELOCITY:	15.0 MPH
ACTUAL MOVING BARRIER VELOCITY:	15.2 MPH

SUBJECT VEHICLE DATA

DIRECT CONTACT DAMAGE LENGTH	65.9
MAXIMUM CUMULATIVE CRUSH AT MOVING BARRIER BUMPER HEIGHT	5.9
MAXIMUM CUMULATIVE CRUSH AT VEHICLE SILL HEIGHT	NA*

VEHICLE ATTITUDES:

POST-TEST: LF: 26.2; RF: 26.6; LR: 25.0; RR: 25.2

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

*POST-TEST SILL MEASUREMENTS WERE NOT RECORDED FOR THIS TEST SINCE THE SILL DEFORMATION WAS VIRTUALLY IDENTICAL TO THE BARRIER BUMPER HEIGHT DEFORMATION.

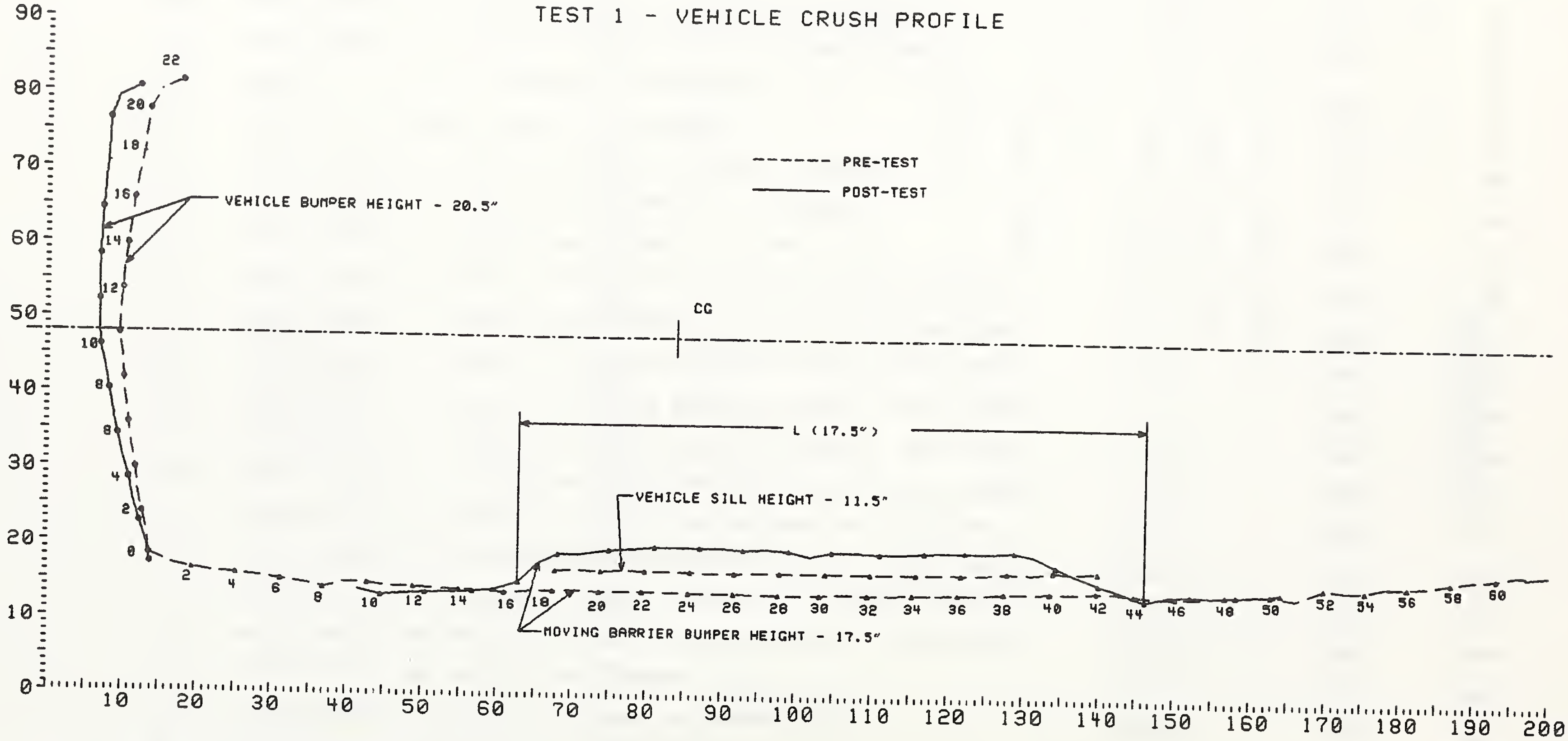
IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Audi 5000 TEST NUMBER: 900924-1

NO.	TYPE OF MEASUREMENT	ALL MEASUREMENTS ARE IN INCHES PRE-TEST	POST-TEST*	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	193.4	NA	NA
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	180.8	NA	NA
X3	REAR SURFACE OF VEHICLE TO FIREWALL	151.2	NA	NA
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	128.6	NA	NA
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	128.8	NA	NA
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	129.3	NA	NA
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	129.6	NA	NA
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	89.3	NA	NA
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	89.2	NA	NA
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	90.4	NA	NA
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	90.6	NA	NA
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	127.6	NA	NA
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	127.3	NA	NA
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	146.7	NA	NA
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	147.0	NA	NA
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	115.7	NA	NA
X17	CENTER OF STEERING COLUMN TO "A" POST	13.2	NA	NA
X18	CENTER OF STEERING COLUMN TO HEADLINER	17.9	NA	NA
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	188.4	NA	NA
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	188.7	NA	NA
X21	LENGTH OF ENGINE BLOCK	22.0	NA	NA

*POST-TEST MEASUREMENTS WERE INADVERTENTLY NOT RECORDED

TEST 1 - VEHICLE CRUSH PROFILE



NOTE: NO PRE-TEST SILL HEIGHT MEASUREMENTS TAKEN FOR TEST 1

VEHICLE CRUSH

TEST NO. 900924-1

AT MOVING BARRIER BUMPER HEIGHT		AT VEHICLE SILL HEIGHT*	
L	85.1	L	NA
C1	0.0	S1	NA
C2	5.9	S2	NA
C3	5.4	S3	NA
C4	5.4	S4	NA
C5	5.1	S5	NA
C6	0.0	S6	NA

DETERMINATION OF VEHICLE CRUSH:

A reference line was constructed connecting the end points of the vehicle's damaged surface. Six equally spaced points were defined along the reference line and labeled C1 through C6 (or S1 through S6 for sill height crush) with the rearmost point of the damaged surface defined as C1 (or S1) and the forwardmost point defined as C6 (or S6). The actual crush distance is a measurement taken perpendicular to and from the reference line at each point (C1 through C6 or S1 through S6) to the vehicle's damaged surface.

NOTES: L is total length of damage surface
C1 through C6 and S1 through S6 are spaced equally apart
ALL MEASUREMENTS ARE IN INCHES

*POST-TEST SILL MEASUREMENTS WERE NOT RECORDED FOR THIS TEST SINCE THE SILL DEFORMATION WAS VIRTUALLY IDENTICAL TO THE BARRIER BUMPER HEIGHT DEFORMATION.

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900924-1

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	RIGHT FRONT SILL	107.1	-26.4	12.8				
	ACCELERATION							
	LATERAL				2.5	91.8	9.3	50.3
2	RIGHT REAR SILL	77.9	-26.3	12.5				
	ACCELERATION							
	LATERAL				1.5	164.3	8.3	54.8
3	VEHICLE CG	106.3	0.0	15.1				
	ACCELERATION							
	LONGITUDINAL				3.3	13.1	3.6	41.0
	LATERAL				2.9	129.9	12.7	11.3
	RESULTANT				12.7	11.3		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR BUMPER
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900924-1

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	MOVING BARRIER	75.2	0.0	12.3				
	CG ACCELERATION							
	LONGITUDINAL				0.5	171.6	7.4	33.3
	LATERAL				1.2	85.5	1.3	78 9
	RESULTANT				7.5	33.0		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE:
X: + FORWARD FROM VEHICLE'S REAR SURFACE
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

TEST #900924-1

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead wide	Photosonic 1B	13	500	Impact overall
2	Overhead tight	Photosonic 1B	25	505	Impact close-up

SECTION 4.0

TEST 900924-2 SUMMARY

TEST CONDITIONS

TEST NUMBER: 900924-2

DATE OF TEST: 9/24/90

TIME OF TEST: 1446

AMBIENT TEMPERATURE AT IMPACT AREA: 69° F

INTENDED MOVING BARRIER VELOCITY: 20.0 MPH

ACTUAL MOVING BARRIER VELOCITY: 20.1 MPH

SUBJECT VEHICLE DATA

DIRECT CONTACT DAMAGE LENGTH	66.4
MAXIMUM CUMULATIVE CRUSH AT MOVING BARRIER BUMPER HEIGHT	10.7
MAXIMUM CUMULATIVE CRUSH AT VEHICLE SILL HEIGHT	5.9

VEHICLE ATTITUDES:

POST-TEST: LF: 25.9; RF: 26.3; LR: 25.3; RR: 24.7

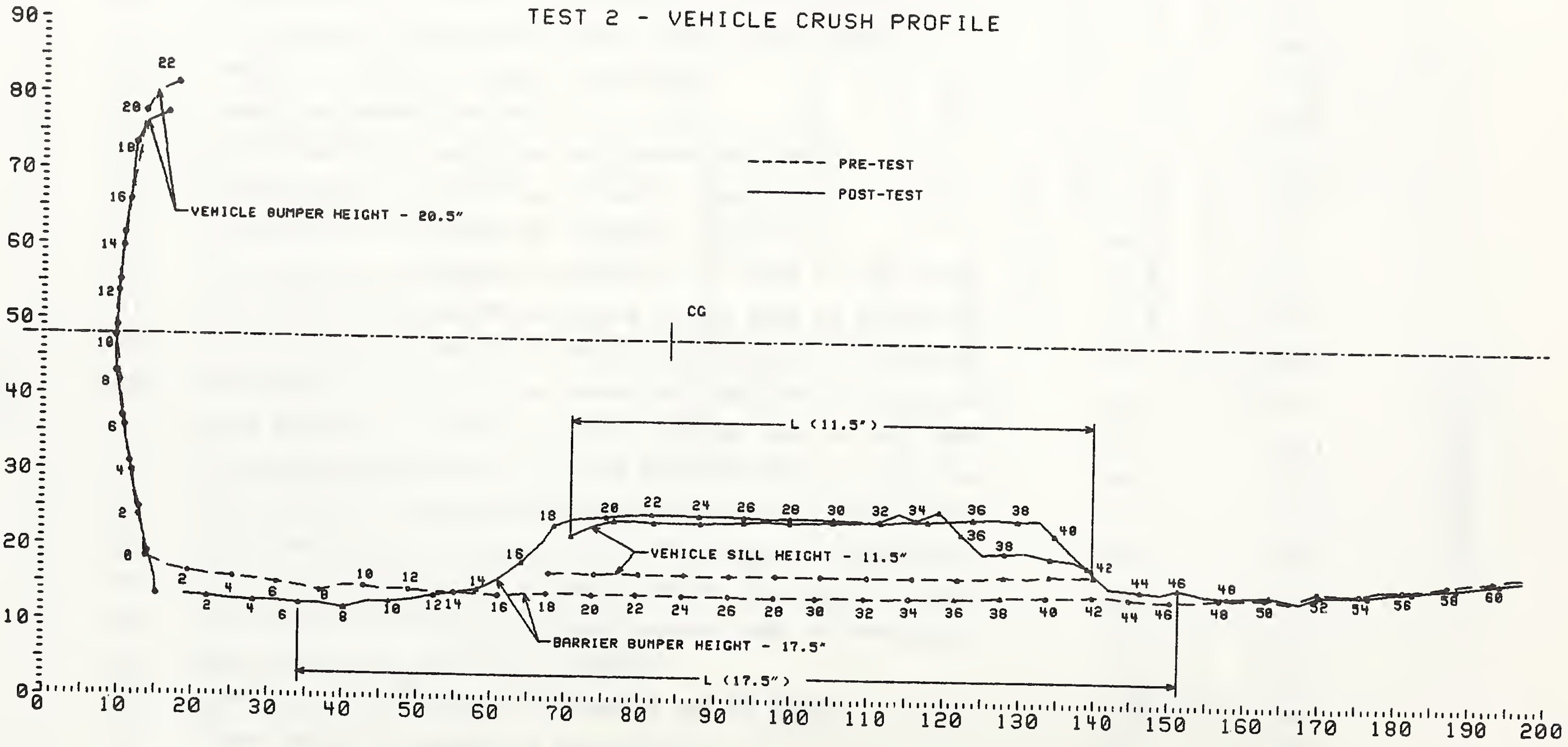
ALL DISTANCE MEASUREMENTS ARE IN INCHES.

IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Audi 5000 **TEST NUMBER:** 900924-2

		ALL MEASUREMENTS ARE IN INCHES		
NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	193.4	192.6	0.8
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	180.8	179.6	1.2
X3	REAR SURFACE OF VEHICLE TO FIREWALL	151.2	150.5	0.7
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	128.6	129.1	-0.5
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	128.8	127.0	1.8
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	129.3	130.0	-0.7
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	129.6	129.0	0.6
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	89.3	89.8	-0.5
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	89.2	87.8	1.4
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	90.4	91.1	-0.7
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	90.6	90.2	0.4
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	127.6	128.2	-0.6
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	127.3	127.6	-0.3
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	146.7	147.1	-0.4
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	147.0	144.2	2.8
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	115.7	115.0	0.7
X17	CENTER OF STEERING COLUMN TO "A" POST	13.2	13.2	0.0
X18	CENTER OF STEERING COLUMN TO HEADLINER	17.9	17.0	0.9
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	188.4	189.8	-1.4
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	188.7	186.2	2.5
X21	LENGTH OF ENGINE BLOCK	22.0	22.0	0.0

NOTE: PRE-TEST VEHICLE MEASUREMENTS ARE FOR THE UNDEFORMED VEHICLE.



TEST 2 - VEHICLE CRUSH PROFILE

VEHICLE CRUSH

TEST NO. 900924-2

AT MOVING BARRIER BUMPER HEIGHT		AT VEHICLE SILL HEIGHT	
L	104.1	L	69.7
C1	0.0	S1	0.0
C2	9.6	S2	5.9
C3	9.6	S3	4.6
C4	10.7	S4	3.7
C5	5.6	S5	2.4
C6	0.0	S6	0.0

DETERMINATION OF VEHICLE CRUSH:

A reference line was constructed connecting the end points of the vehicle's damaged surface. Six equally spaced points were defined along the reference line and labeled C1 through C6 (or S1 through S6 for sill height crush) with the rearmost point of the damaged surface defined as C1 (or S1) and the forwardmost point defined as C6 (or S6). The actual crush distance is a measurement taken perpendicular to and from the reference line at each point (C1 through C6 or S1 through S6) to the vehicle's damaged surface.

NOTES: L is total length of damage surface

C1 through C6 and S1 through S6 are spaced equally apart

ALL MEASUREMENTS ARE IN INCHES

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900924-2

No. LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1 RIGHT FRONT SILL	107.1	-26.4	12.8				
ACCELERATION							
LATERAL				1.8	86.5	22.6	14.6
2 RIGHT REAR SILL	77.9	-26.3	12.5				
ACCELERATION							
LATERAL				2.0	125.0	16.7	14.0
3 VEHICLE CG	106.3	0.0	15.1				
ACCELERATION							
LONGITUDINAL				7.1	19.0	7.2	9.8
LATERAL				8.2	24.5	50.4	13.8
RESULTANT				50.4	13.6		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE:
X: + FORWARD FROM VEHICLE'S REAR BUMPER
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900924-2

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX G	MSEC	MAX G	MSEC
1	MOVING BARRIER CG ACCELERATION	75.2	0.0	12.3				
	LONGITUDINAL				0.4	308.1	12.7	16.8
	LATERAL				2.1	104.9	2.7	41.0
	RESULTANT				12.8	16.9		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR SURFACE
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

TEST #900924-2

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead wide	Photosonic 1B	13	500	Impact overall
2	Overhead tight	Photosonic 1B	25	500	Impact close-up

SECTION 5.0

TEST 900925-1 SUMMARY

TEST CONDITIONS

TEST NUMBER: 900925-1

DATE OF TEST: 9/25/90

TIME OF TEST: 936

AMBIENT TEMPERATURE AT IMPACT AREA:	68° F
INTENDED MOVING BARRIER VELOCITY	20.0 MPH
ACTUAL MOVING BARRIER VELOCITY	20.0 MPH

SUBJECT VEHICLE DATA

DIRECT CONTACT DAMAGE LENGTH	70.8
MAXIMUM CUMULATIVE CRUSH AT MOVING BARRIER BUMPER HEIGHT	16.8
MAXIMUM CUMULATIVE CRUSH AT VEHICLE SILL HEIGHT	5.9

VEHICLE ATTITUDES:

POST-TEST: LF: 25.9; RF: 27.0; LR: 24.9; RR: 24.4

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

IMPACTED VEHICLE MEASUREMENTS

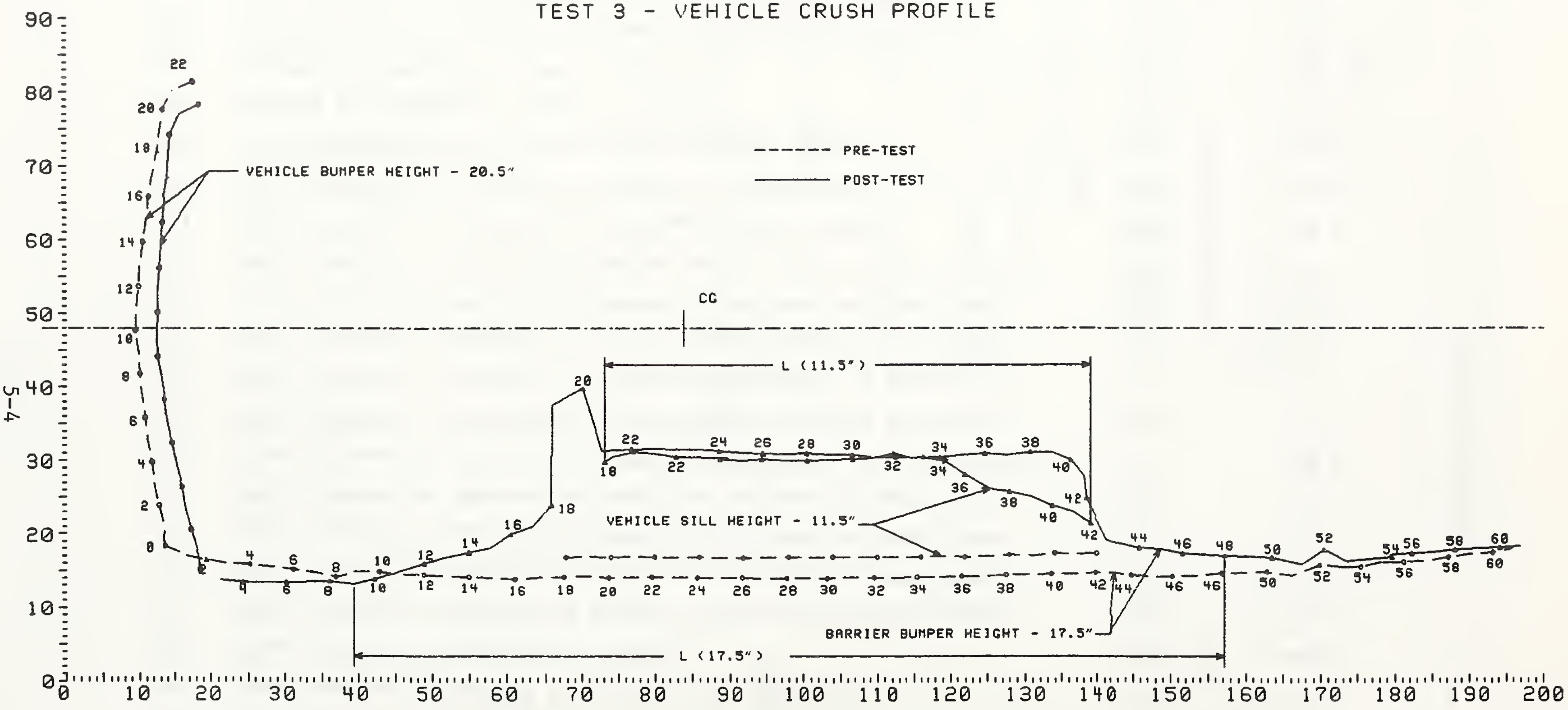
VEHICLE MAKE/MODEL: Audi 5000 **TEST NUMBER:** 900925-1

ALL MEASUREMENTS ARE IN INCHES

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	193.4	190.2	-3.2
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	180.8	177.1	3.7
X3	REAR SURFACE OF VEHICLE TO FIREWALL	151.2	148.2	3.0
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	128.6	129.2	-0.6
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	128.8	126.2	2.6
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	129.3	130.2	-0.9
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	129.6	127.5	2.1
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	89.3	89.9	-0.6
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	89.2	87.0	2.2
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	90.4	91.2	-0.8
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	90.6	88.5	2.1
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	127.6	128.8	-1.2
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	127.3	126.8	0.5
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	146.7	146.9	-0.2
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	147.0	142.1	4.9
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	115.7	112.8	2.9
X17	CENTER OF STEERING COLUMN TO "A" POST	13.2	12.5	0.7
X18	CENTER OF STEERING COLUMN TO HEADLINER	17.9	16.5	1.4
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	188.4	186.9	1.5
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	188.7	183.5	5.2
X21	LENGTH OF ENGINE BLOCK	22.0	22.0	0.0

NOTE: PRE-TEST MEASUREMENTS ARE FOR THE UNDEFORMED VEHICLE.

TEST 3 - VEHICLE CRUSH PROFILE



VEHICLE CRUSH

TEST NO. 900925-1

AT MOVING BARRIER BUMPER HEIGHT		AT VEHICLE SILL HEIGHT	
L	113.5	L	67.0
C1	0.0	S1	0.0
C2	14.8	S2	3.2
C3	15.1	S3	5.9
C4	16.8	S4	3.8
C5	6.5	S5	2.6
C6	0.0	S6	0.0

DETERMINATION OF VEHICLE CRUSH:

A reference line was constructed connecting the end points of the vehicle's damaged surface. Six equally spaced points were defined along the reference line and labeled C1 through C6 (or S1 through S6 for sill height crush) with the rearmost point of the damaged surface defined as C1 (or S1) and the forwardmost point defined as C6 (or S6). The actual crush distance is a measurement taken perpendicular to and from the reference line at each point (C1 through C6 or S1 through S6) to the vehicle's damaged surface.

NOTES: L is total length of damage surface

C1 through C6 through S1 through S6 are spaced equally apart

ALL MEASUREMENTS ARE IN INCHES

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900925-1

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX G	MSEC	MAX G	MSEC
1	RIGHT FRONT SILL	107.1	-26.4	12.8				
	ACCELERATION							
	LATERAL				4.1	52.9	23.3	15.9
2	RIGHT REAR SILL	77.9	-26.3	12.5				
	ACCELERATION							
	LATERAL				1.5	115.4	16.1	11.1
3	VEHICLE CG	106.3	0.0	15.1				
	ACCELERATION							
	LONGITUDINAL				11.9	17.1	17.5	9.6
	LATERAL				33.7	16.6	107.0	9.5
	RESULTANT				108.4	9.5		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE:
X: + FORWARD FROM VEHICLE'S REAR BUMPER
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900925-1

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	MOVING BARRIER	75.2	0.0	12.3				
	CG ACCELERATION							
	LONGITUDINAL				0.8	129.3	12.9	6.0
	LATERAL				3.2	101.5	2.5	16.0
	RESULTANT				12.9	6.0		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR SURFACE
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

TEST #900925-1

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead wide	Photosonic 1B	13	500	Impact overall
2	Overhead tight	Photosonic 1B	25	505	Impact close-up

SECTION 6.0

TEST 900925-2 SUMMARY

TEST CONDITIONS

TEST NUMBER: 900925-2

DATE OF TEST: 9/25/90

TIME OF TEST: 1139

AMBIENT TEMPERATURE AT IMPACT AREA:	71° F
INTENDED MOVING BARRIER VELOCITY:	40.0 MPH
ACTUAL MOVING BARRIER VELOCITY:	40.1 MPH

SUBJECT VEHICLE DATA

DIRECT CONTACT DAMAGE LENGTH	75.7
MAXIMUM CUMULATIVE CRUSH AT MOVING BARRIER BUMPER HEIGHT	32.4
MAXIMUM CUMULATIVE CRUSH AT VEHICLE SILL HEIGHT	9.5

VEHICLE ATTITUDES:

POST-TEST: LF: 23.2; RF: 26.2; LR: 23.6; RR: 24.4

ALL DISTANCE MEASUREMENTS ARE IN INCHES.

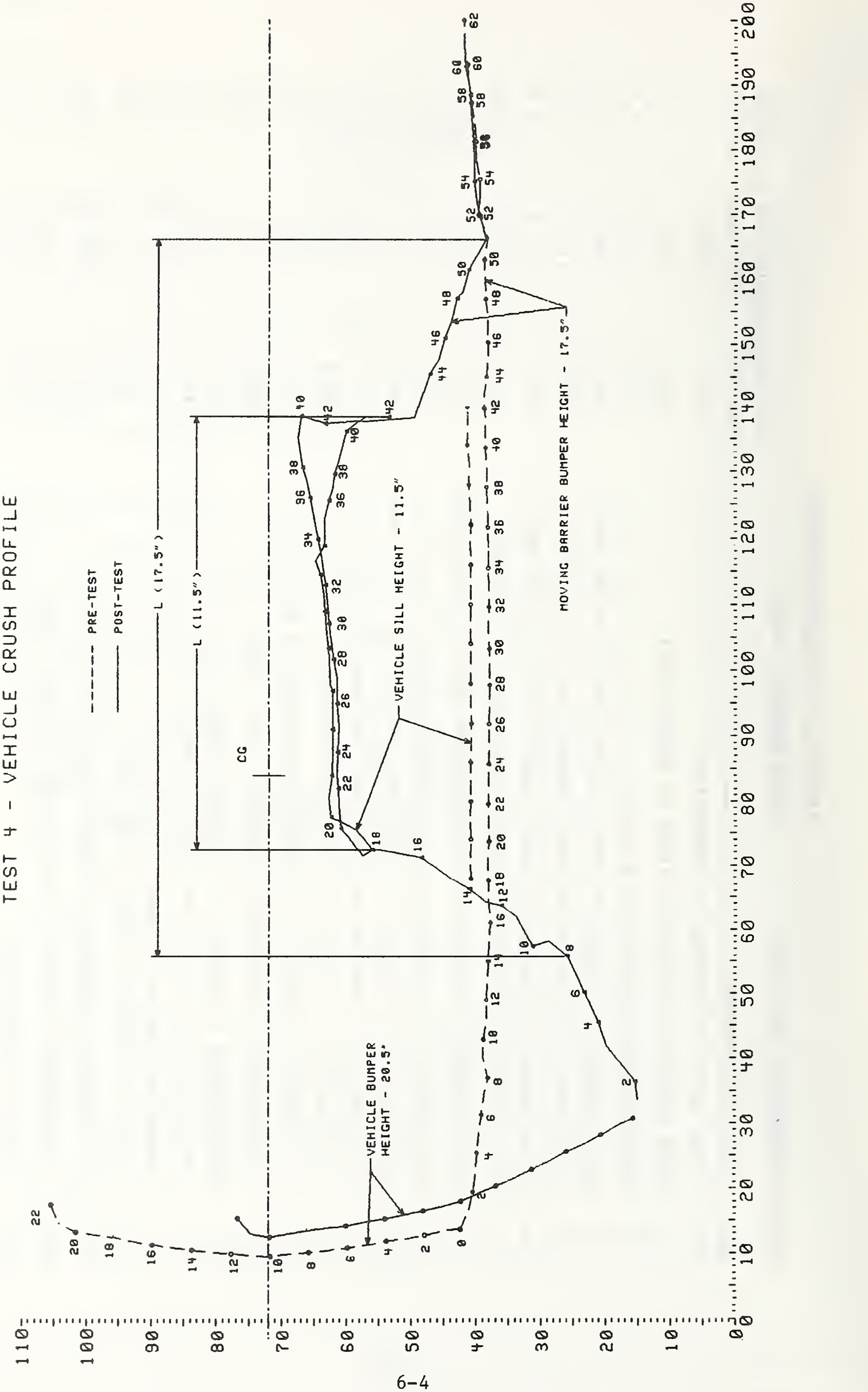
IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Audi 5000 TEST NUMBER: 900925-2

ALL MEASUREMENTS ARE IN INCHES

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	193.4	183.8	9.6
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	180.8	174.9	5.9
X3	REAR SURFACE OF VEHICLE TO FIREWALL	151.2	147.8	3.4
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	128.6	130.4	-1.8
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	128.8	122.1	6.7
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	129.3	131.2	-1.9
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	129.6	125.3	4.3
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	89.3	91.1	-1.8
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	89.2	84.8	4.4
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	90.4	92.1	-1.7
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	90.6	86.4	4.2
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	127.6	129.5	-1.9
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	127.3	125.2	2.1
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	146.7	149.1	-2.4
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	147.0	134.3	12.6
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	115.7	110.5	5.2
X17	CENTER OF STEERING COLUMN TO "A" POST	13.2	13.5	-0.3
X18	CENTER OF STEERING COLUMN TO HEADLINER	17.9	12.9	5.0
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	188.4	198.8	-10.4
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	188.7	171.8	16.9
X21	LENGTH OF ENGINE BLOCK	22.0	22.0	0.0

NOTE: PRE-TEST MEASUREMENTS ARE FOR THE UNDEFORMED VEHICLE.



TEST 4 - VEHICLE CRUSH PROFILE

VEHICLE CRUSH

TEST NO. 900925-2

AT MOVING BARRIER BUMPER HEIGHT		AT VEHICLE SILL HEIGHT	
L	111.9	L	67.0
C1	0.0	S1	0.0
C2	12.2	S2	6.5
C3	31.4	S3	9.5
C4	31.4	S4	5.4
C5	32.4	S5	7.0
C6	0.0	S6	0.0

DETERMINATION OF VEHICLE CRUSH:

A reference line was constructed connecting the end points of the vehicle's damaged surface. Six equally spaced points were defined along the reference line and labeled C1 through C6 (or S1 through S6 for sill height crush) with the rearmost point of the damaged surface defined as C1 (or S1) and the forwardmost point defined as C6 (or S6). The actual crush distance is a measurement taken perpendicular to and from the reference line at each point (C1 through C6 or S1 through S6) to the vehicle's damaged surface.

NOTES: L is total length of damage surface

C1 through C6 and S1 through S6 are spaced equally apart

ALL MEASUREMENTS ARE IN INCHES

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900925-2

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	RIGHT FRONT SILL	107.1	-26.4	12.8				
	ACCELERATION							
	LATERAL				7.8	66.3	47.1	13.6
2	RIGHT REAR SILL	77.9	-26.3	12.5				
	ACCELERATION							
	LATERAL				4.7	67.8	41.8	15.2
3	VEHICLE CG	106.3	0.0	15.1				
	ACCELERATION							
	LONGITUDINAL				14.0	11.9	9.6	7.5
	LATERAL				36.0	20.8	123.2	8.5
	RESULTANT				123.4	8.5		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR BUMPER
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 900925-2

No.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	MOVING BARRIER	75.2	0.0	12.3				
	CG ACCELERATION							
	LONGITUDINAL				0.6	247.5	26.6	6.4
	LATERAL				4.2	33.4	6.3	25.6
	RESULTANT				26.6	6.4		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR SURFACE
Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

TEST #900925-2

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead wide	Photosonic 1B	13	500	Impact overall
2	Overhead tight	Photosonic 1B	25	507	Impact close-up

APPENDIX A

PHOTOGRAPHS

TEST #900924-1

LIST OF PHOTOGRAPHS

1 PRE-TEST OVERALL FRONT VIEW
2. POST-TEST OVERALL FRONT VIEW
3. PRE-TEST OVERALL LEFT SIDE VIEW
4. POST-TEST OVERALL LEFT SIDE VIEW
5. PRE-TEST OVERALL REAR VIEW
6. POST-TEST OVERALL REAR VIEW
7. PRE-TEST OVERALL RIGHT SIDE VIEW
8. POST-TEST OVERALL RIGHT SIDE VIEW
9. PRE-TEST LEFT FRONT THREE-QUARTER VIEW
10. POST-TEST LEFT FRONT THREE-QUARTER VIEW
11. PRE-TEST LEFT REAR THREE-QUARTER VIEW
12. POST-TEST LEFT REAR THREE-QUARTER VIEW
13. PRE-TEST CLOSE-UP LEFT REAR VIEW
14. POST-TEST CLOSE-UP LEFT REAR VIEW
15. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW
16. POST-TEST LEFT SIDE CLOSE-UP VIEW

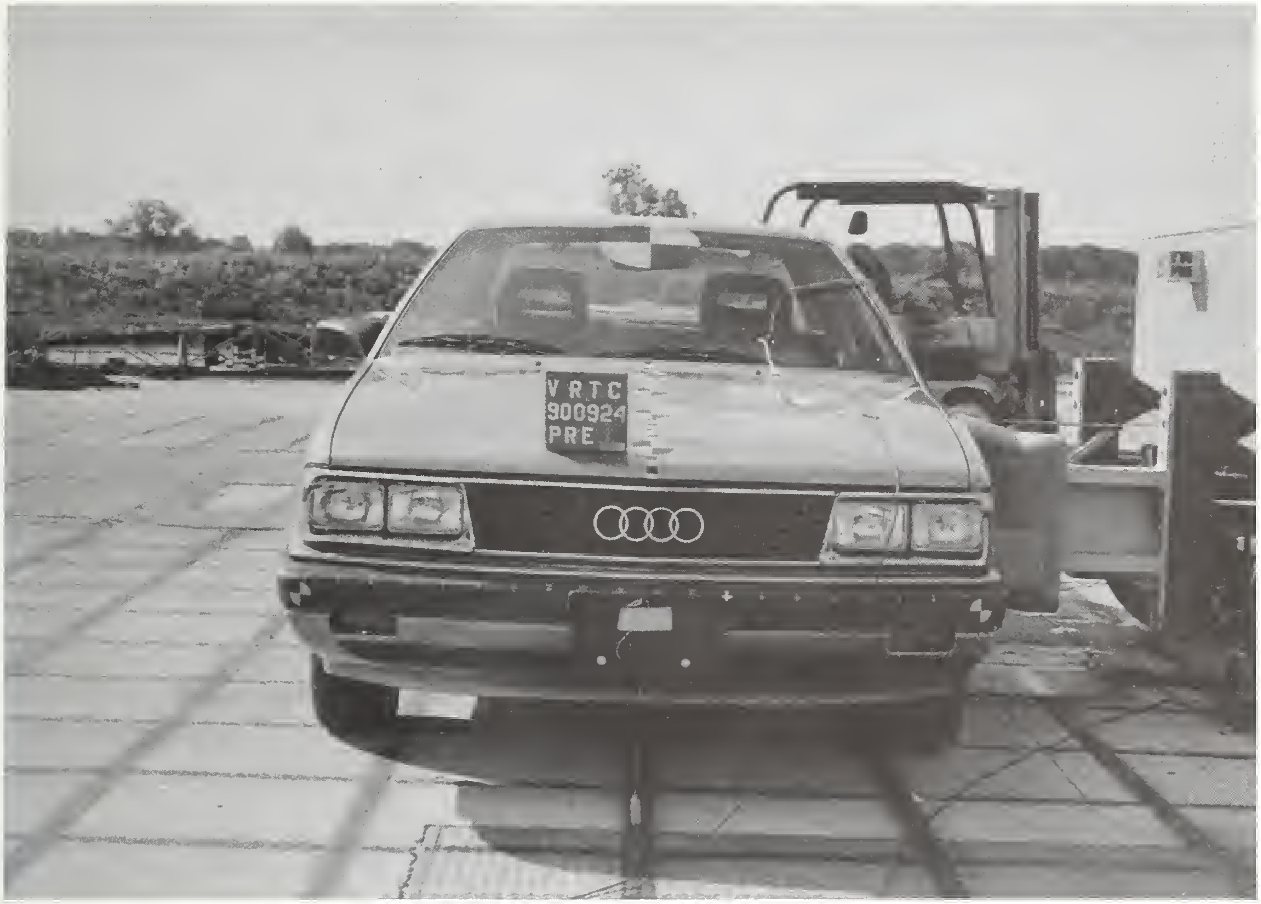


Figure A-1. PRE-TEST OVERALL FRONT VIEW

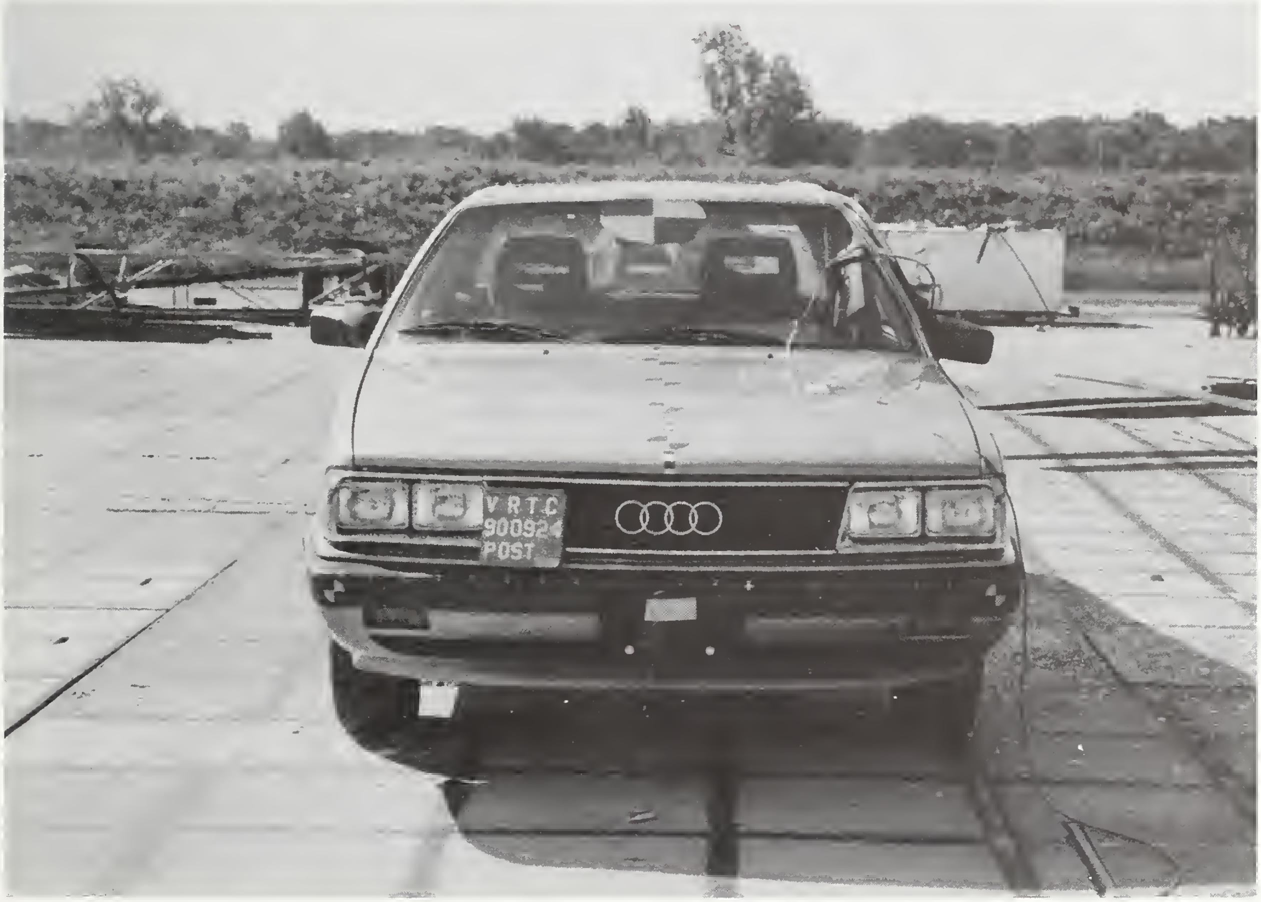


Figure A-2. POST-TEST OVERALL FRONT VIEW

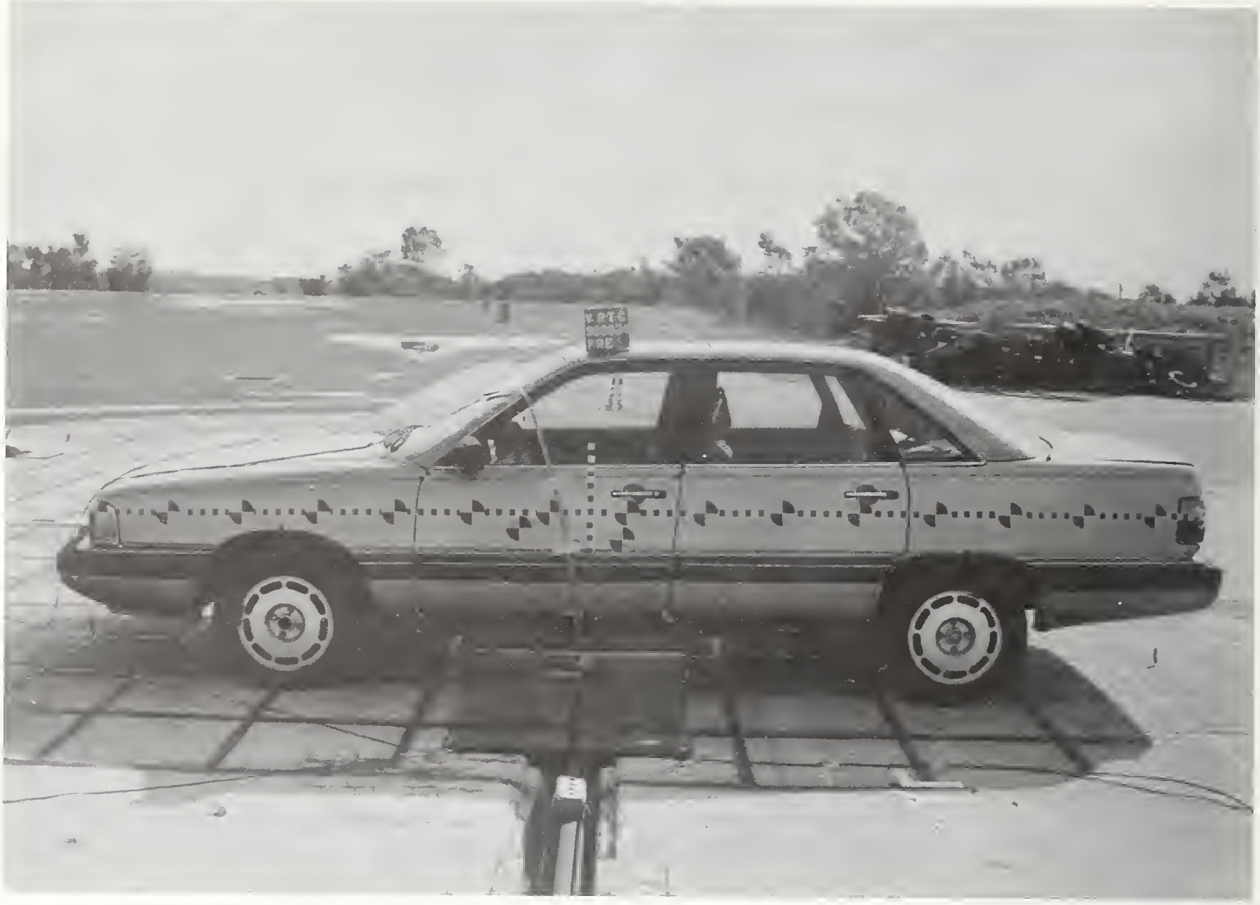


Figure A-3. PRE-TEST OVERALL LEFT SIDE VIEW

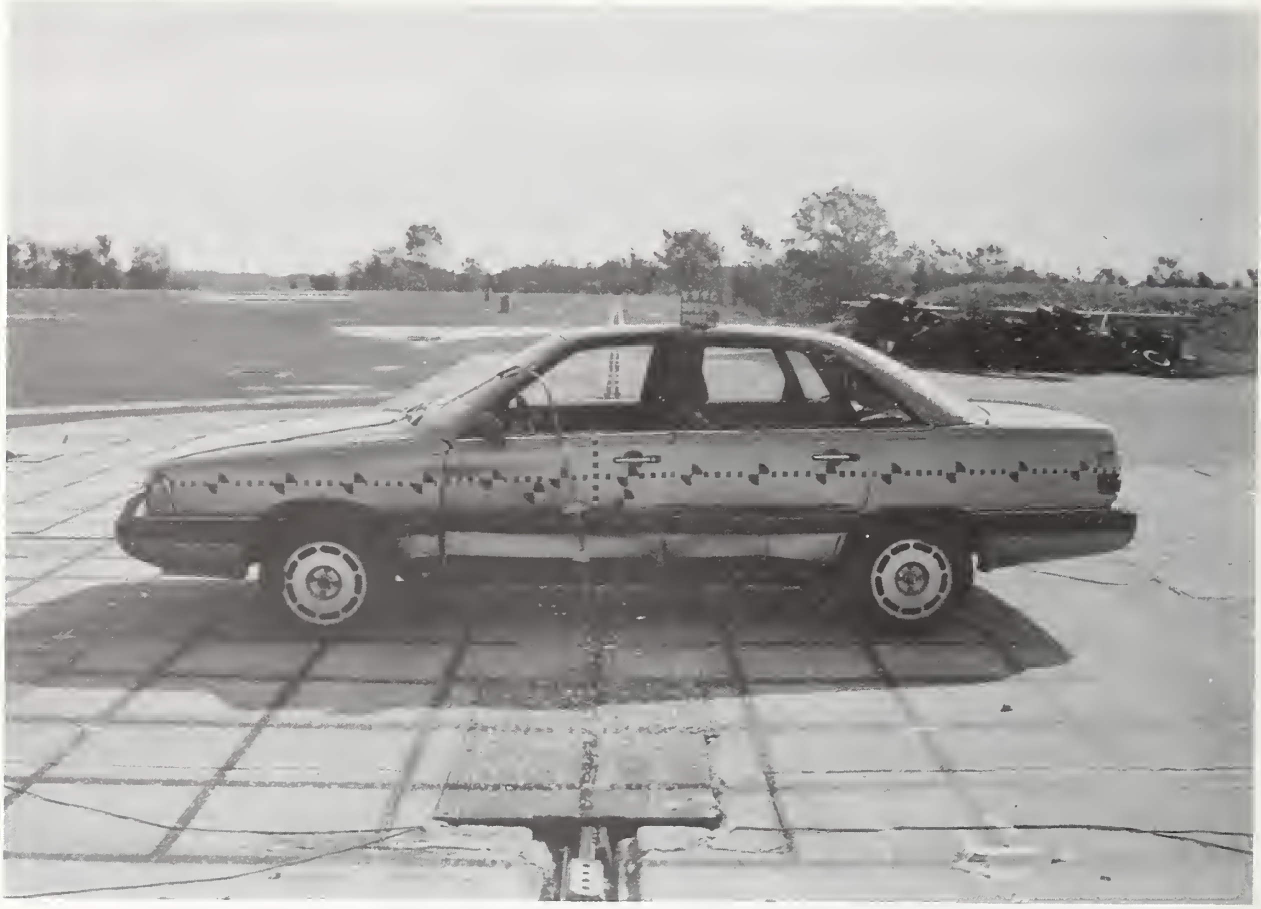


Figure A-4. POST-TEST OVERALL LEFT SIDE VIEW

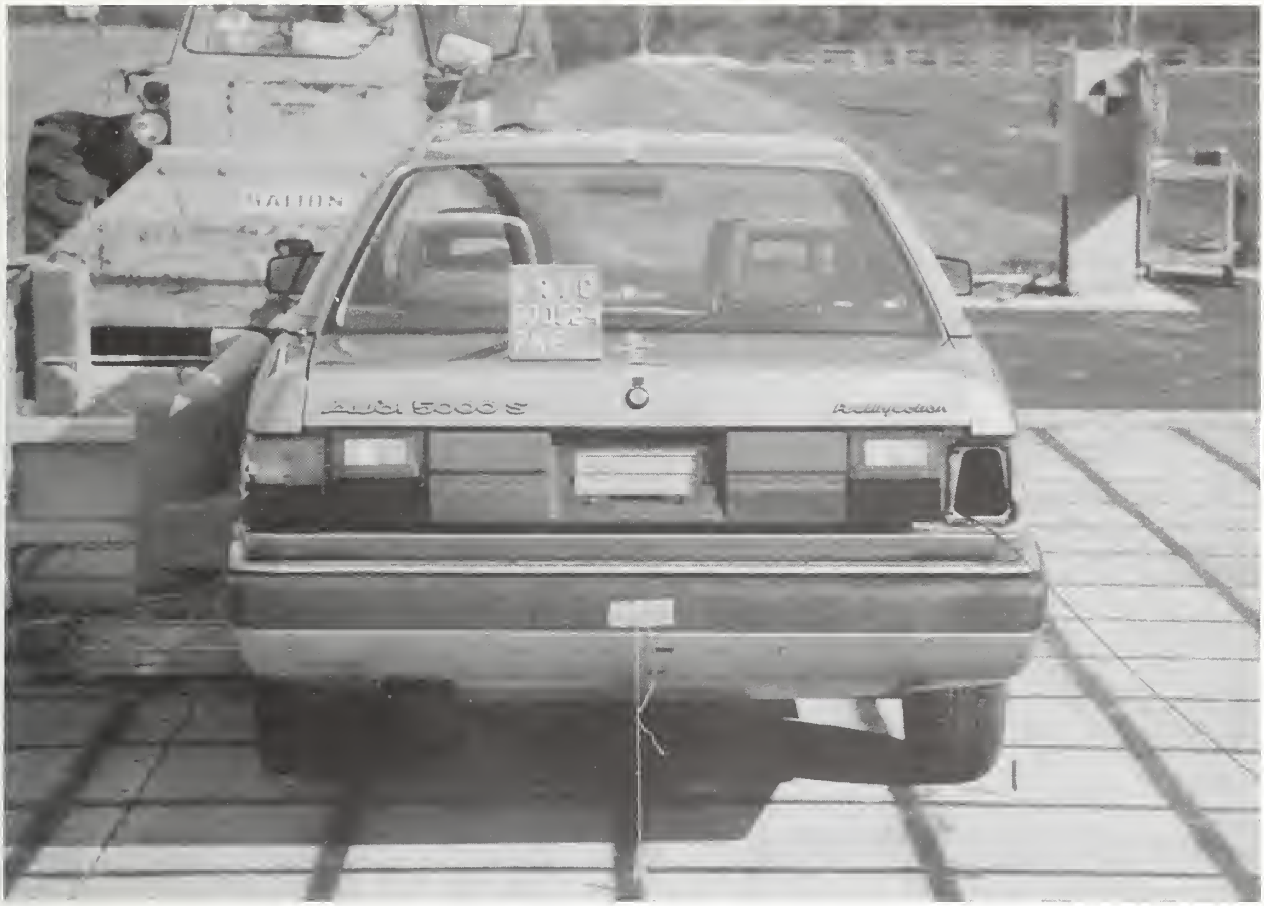


Figure A-5. PRE-TEST OVERALL REAR VIEW

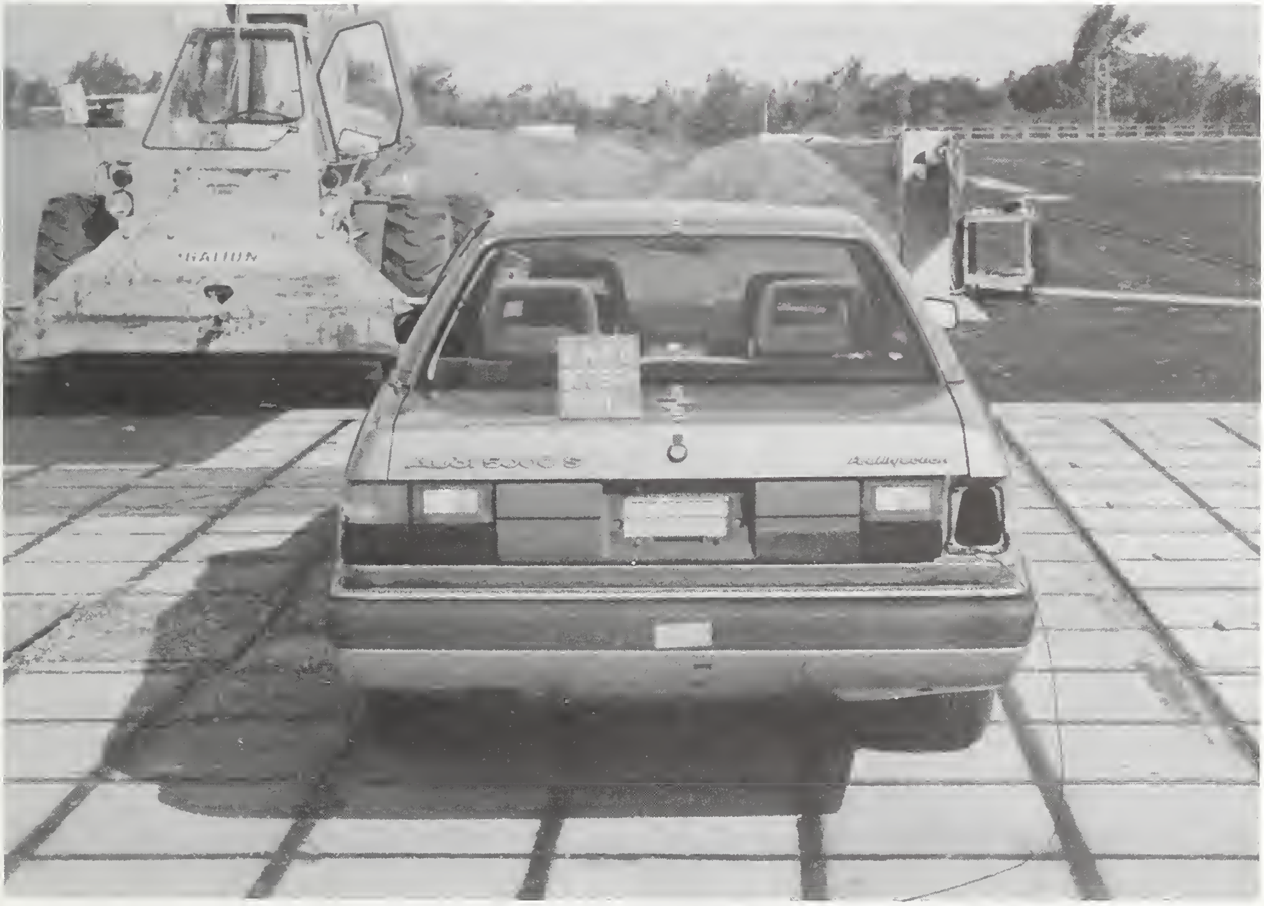


Figure A-6. POST-TEST OVERALL REAR VIEW

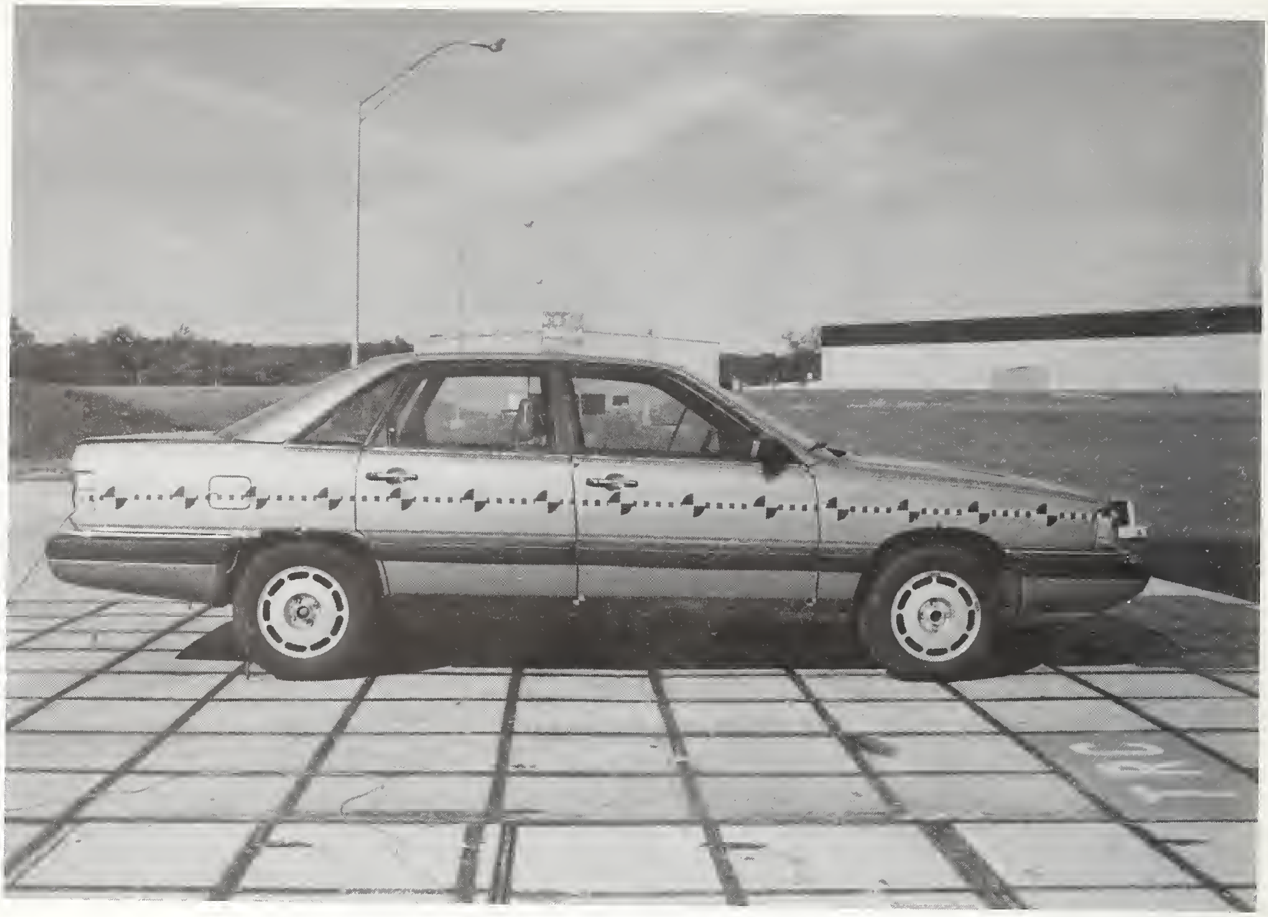


Figure A-7. PRE-TEST OVERALL RIGHT SIDE VIEW

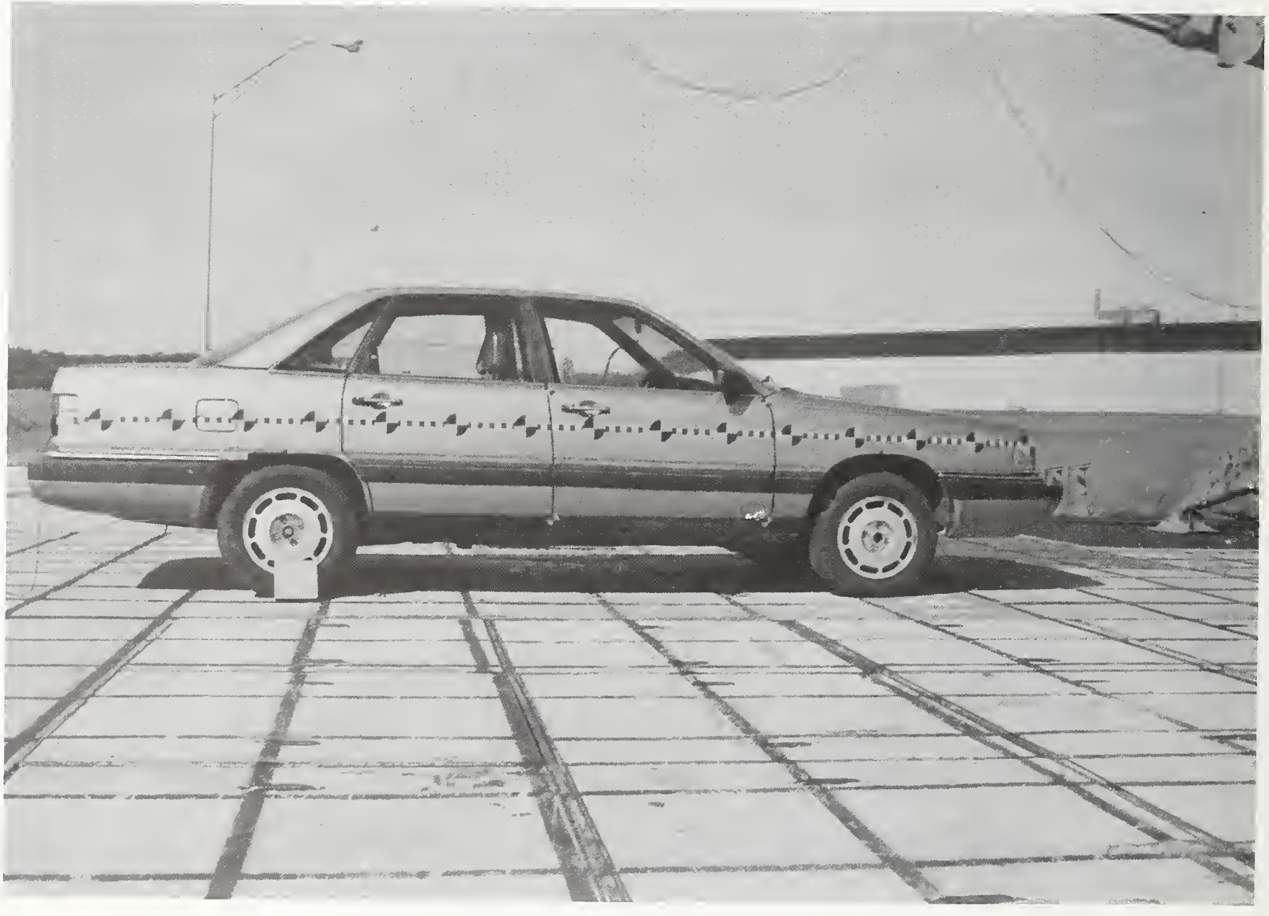


Figure A-8. POST-TEST OVERALL RIGHT SIDE VIEW

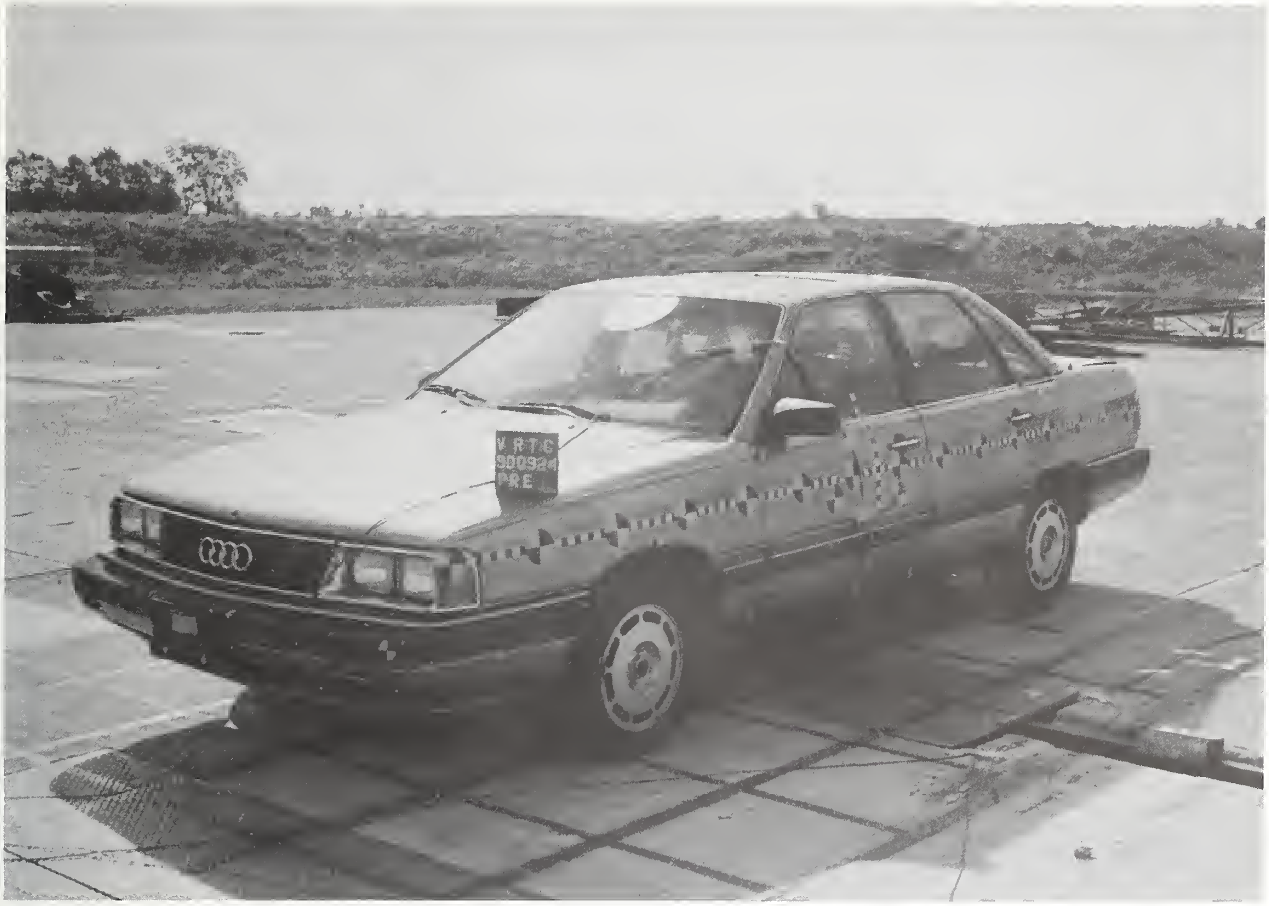


Figure A-9. PRE-TEST LEFT FRONT THREE-QUARTER VIEW

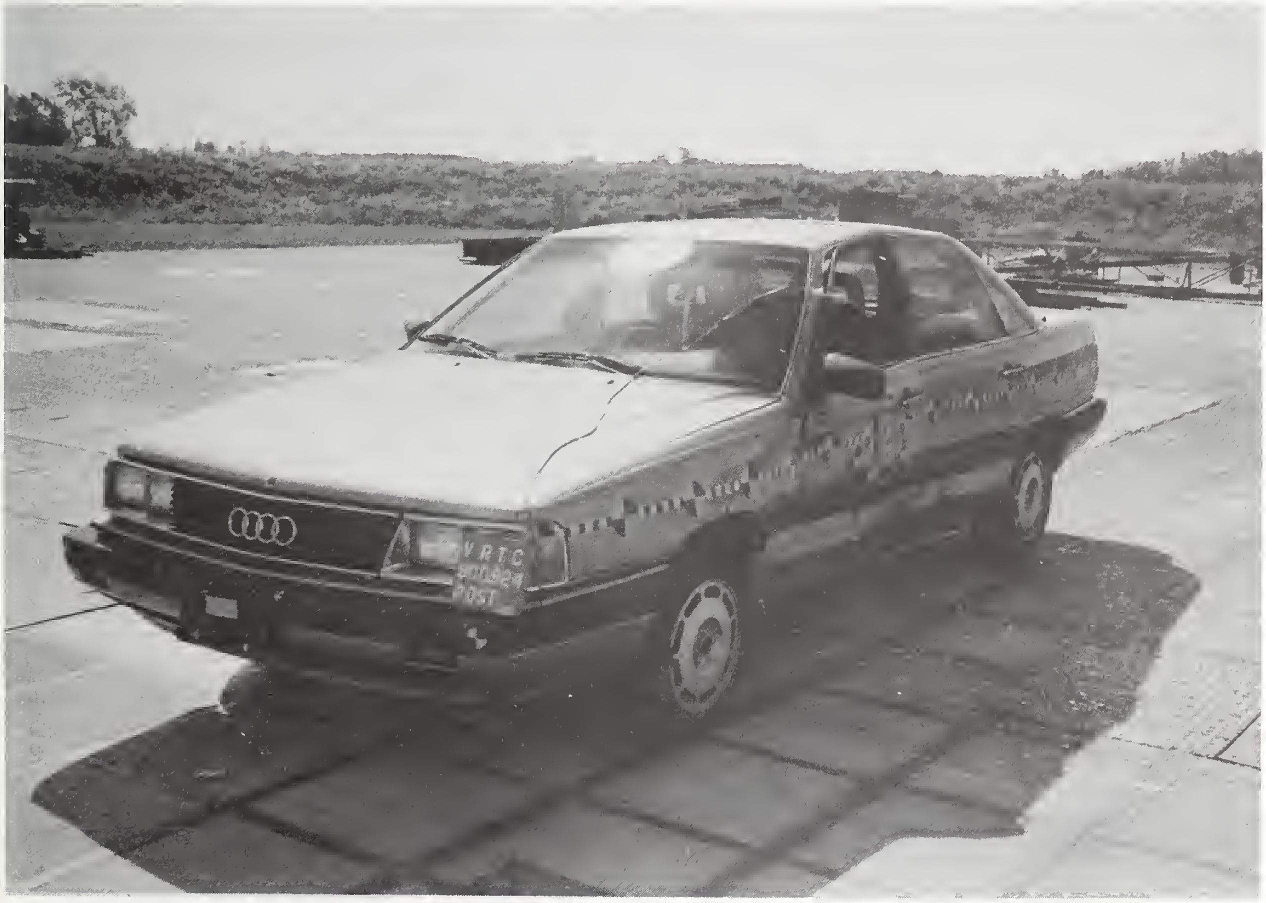


Figure A-10. POST-TEST LEFT FRONT THREE-QUARTER VIEW

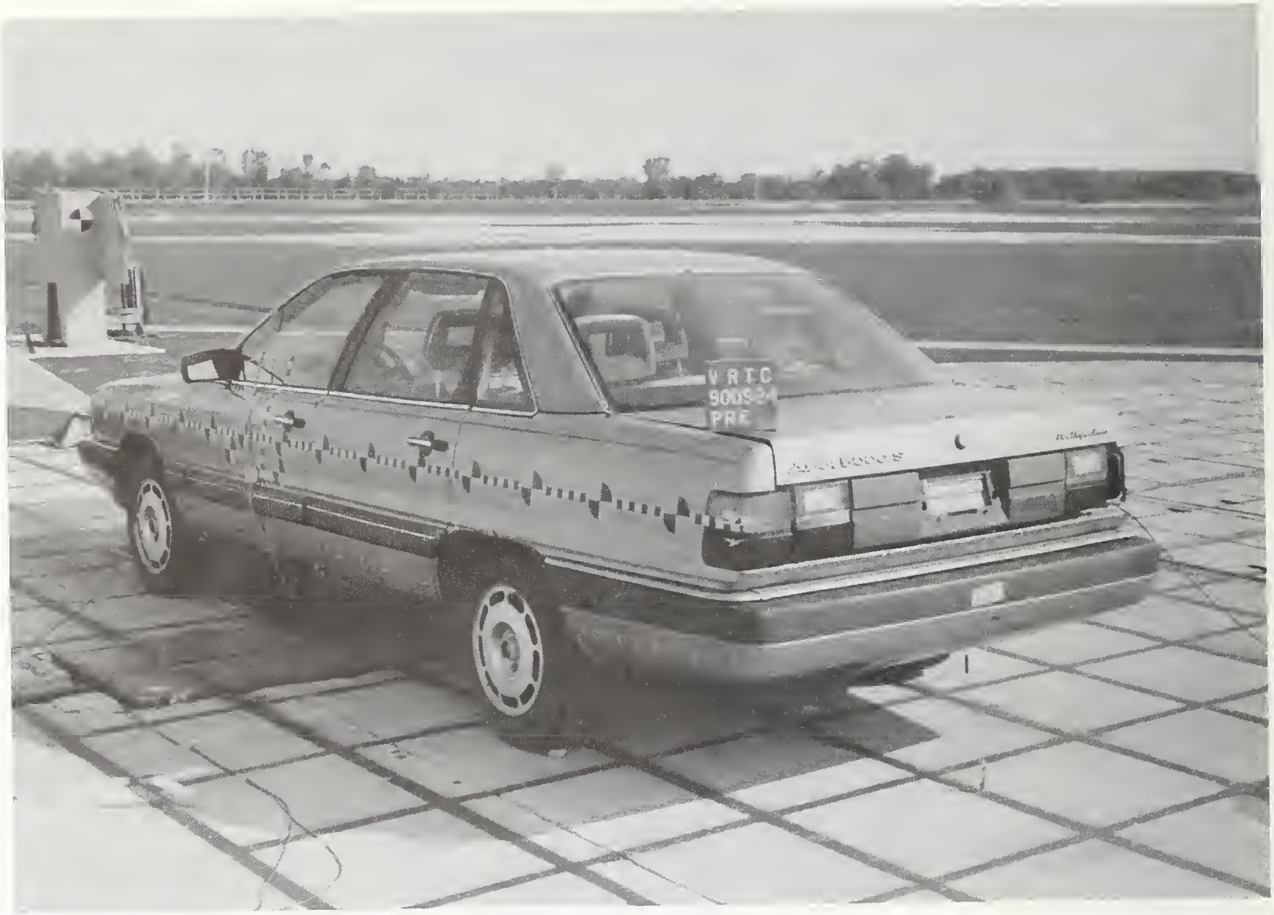


Figure A-11. PRE-TEST LEFT REAR THREE-QUARTER VIEW

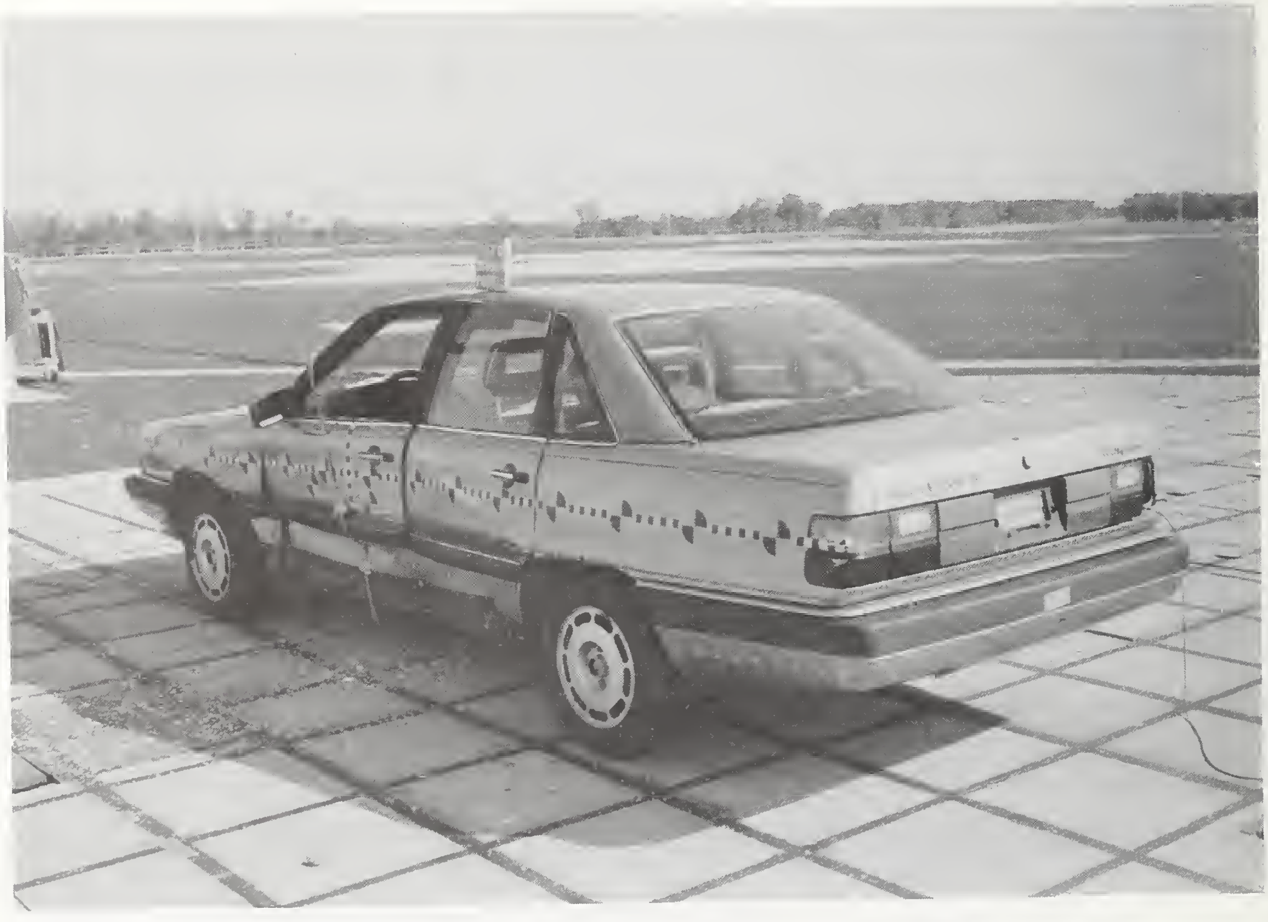


Figure A-12. POST-TEST LEFT REAR THREE-QUARTER VIEW

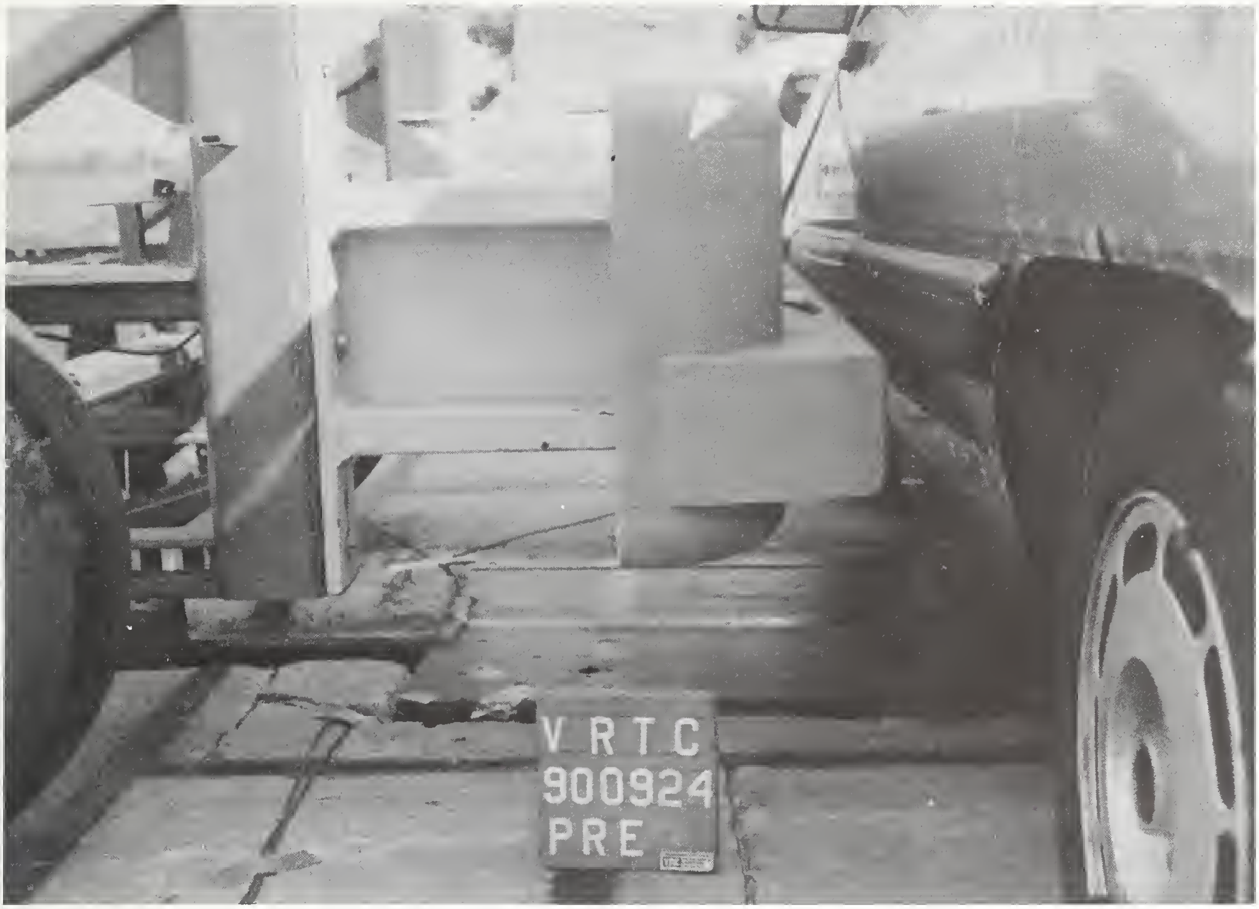


Figure A-13. PRE-TEST CLOSE-UP LEFT REAR VIEW

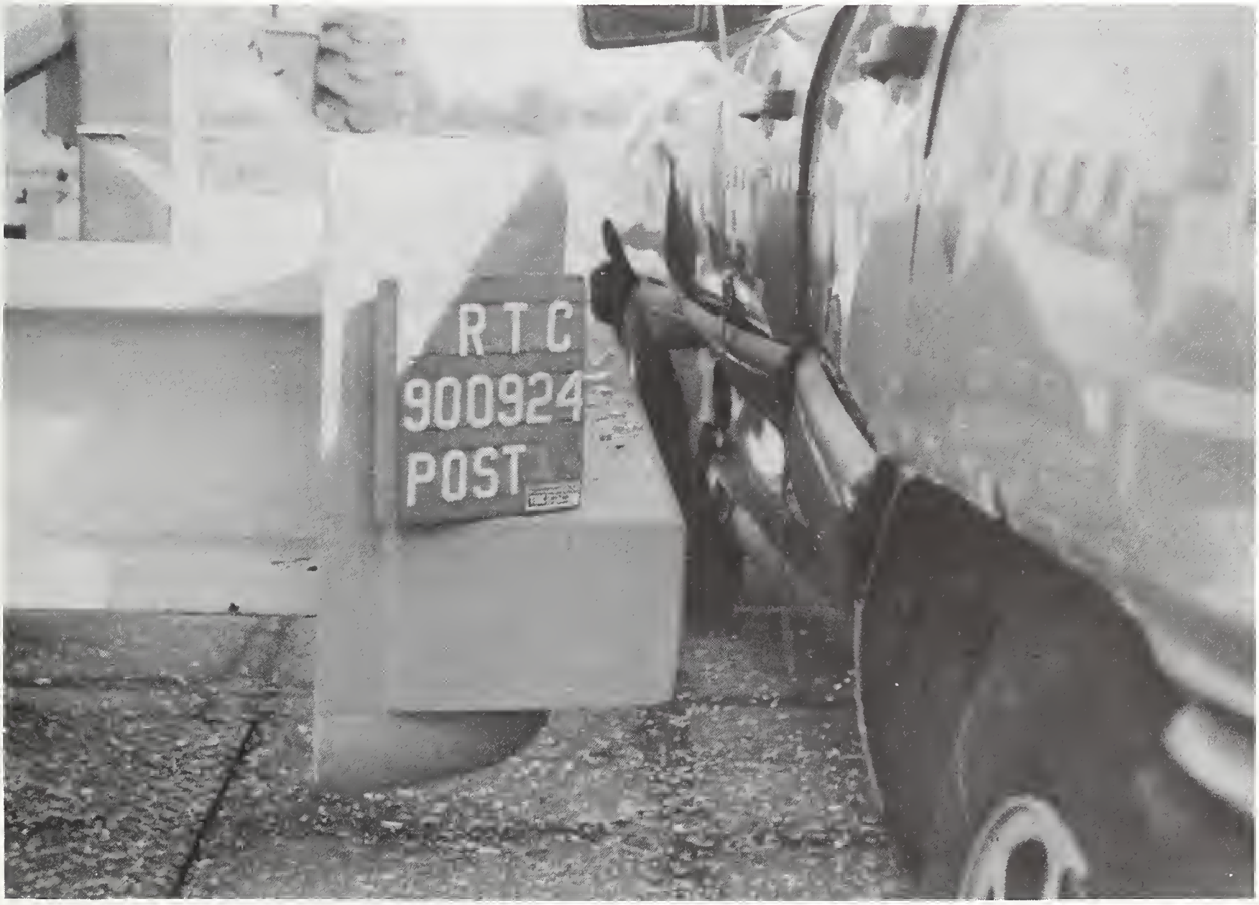


Figure A-14. POST-TEST CLOSE-UP LEFT REAR VIEW

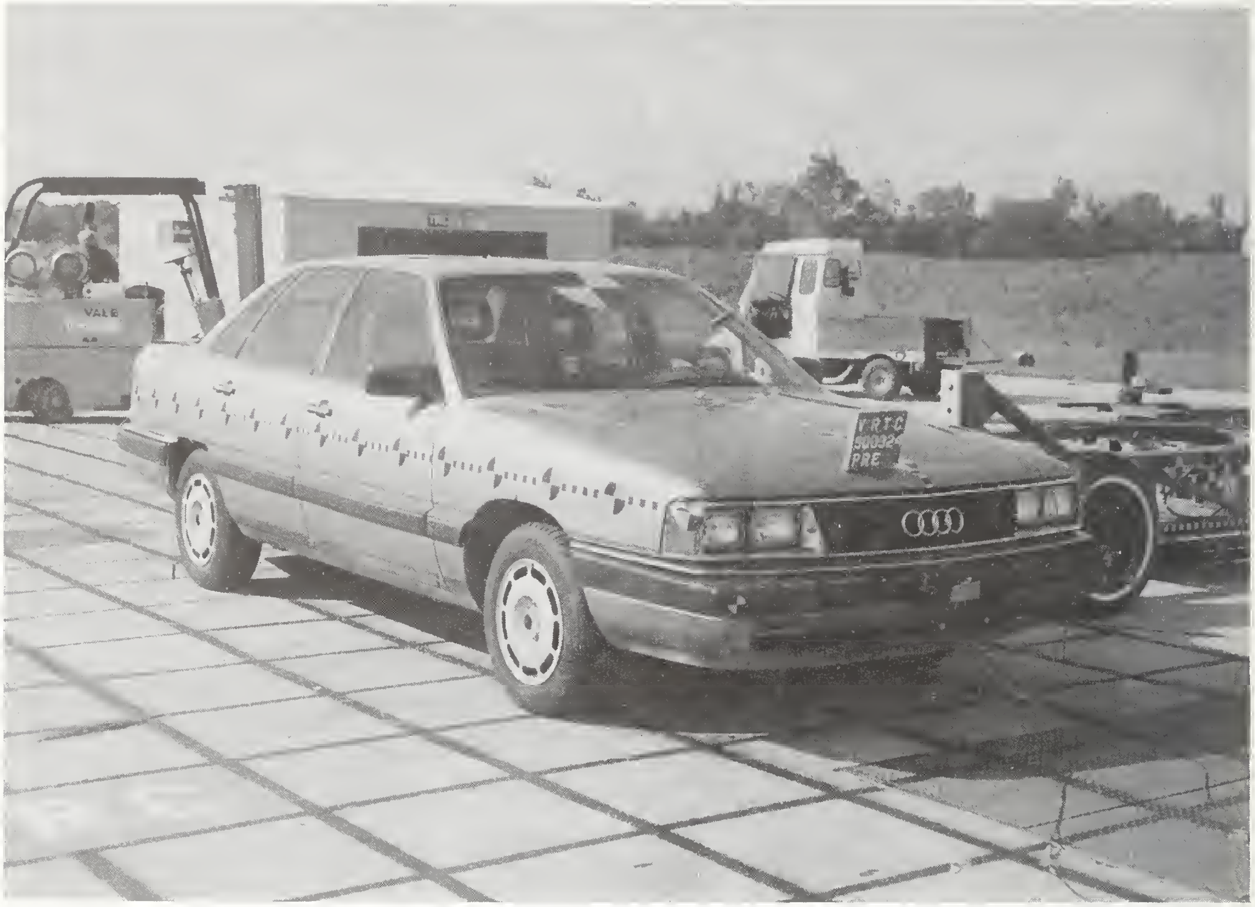


Figure A-15. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

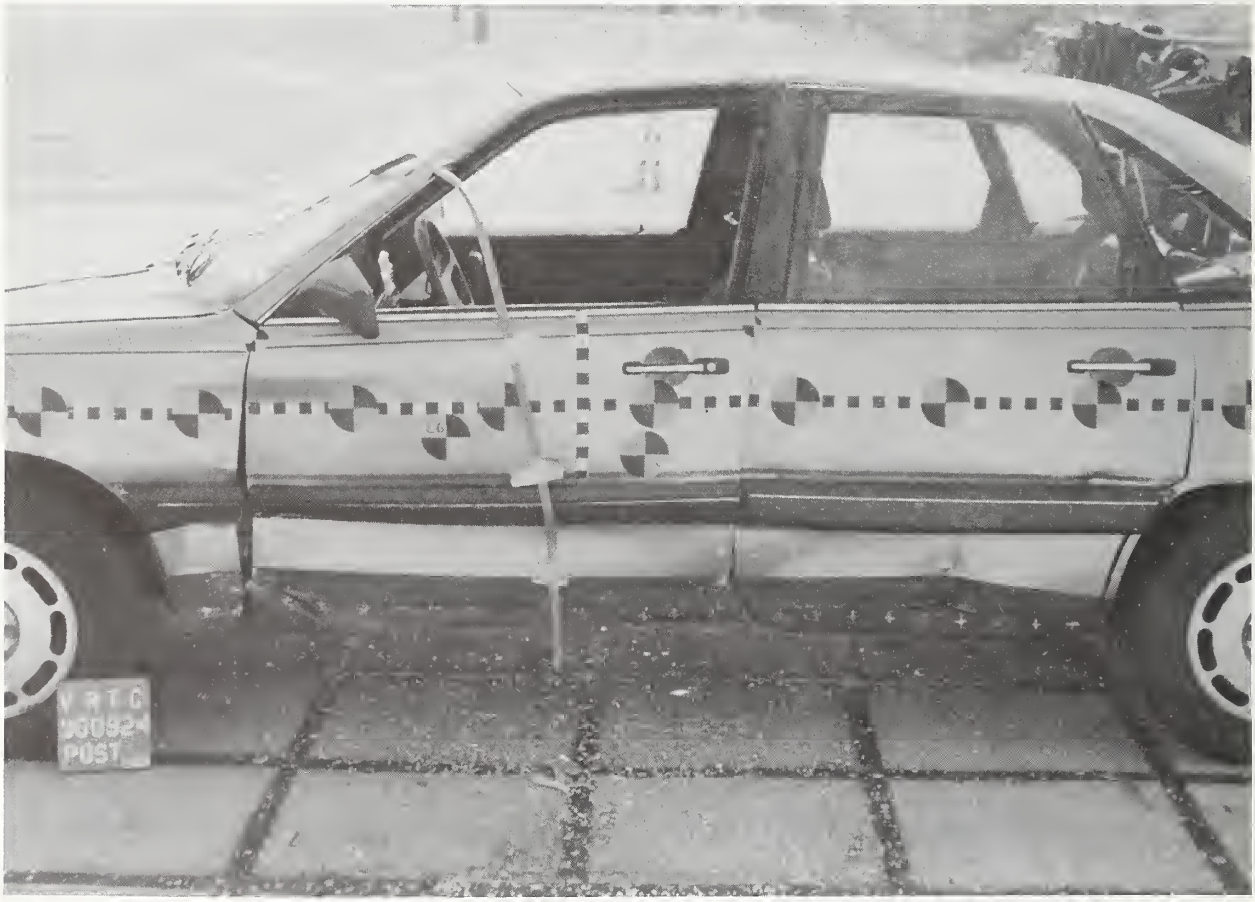


Figure A-16. POST-TEST LEFT SIDE CLOSE-UP VIEW

TEST #900924-2

LIST OF PHOTOGRAPHS

17. POST-TEST OVERALL FRONT VIEW
18. POST-TEST OVERALL LEFT SIDE VIEW
19. POST-TEST OVERALL REAR VIEW
20. POST-TEST OVERALL RIGHT SIDE VIEW
21. POST-TEST LEFT FRONT THREE-QUARTER VIEW
22. POST-TEST LEFT REAR THREE-QUARTER VIEW
23. POST-TEST CLOSE-UP LEFT REAR VIEW
24. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
25. POST-TEST LEFT SIDE CLOSE-UP VIEW

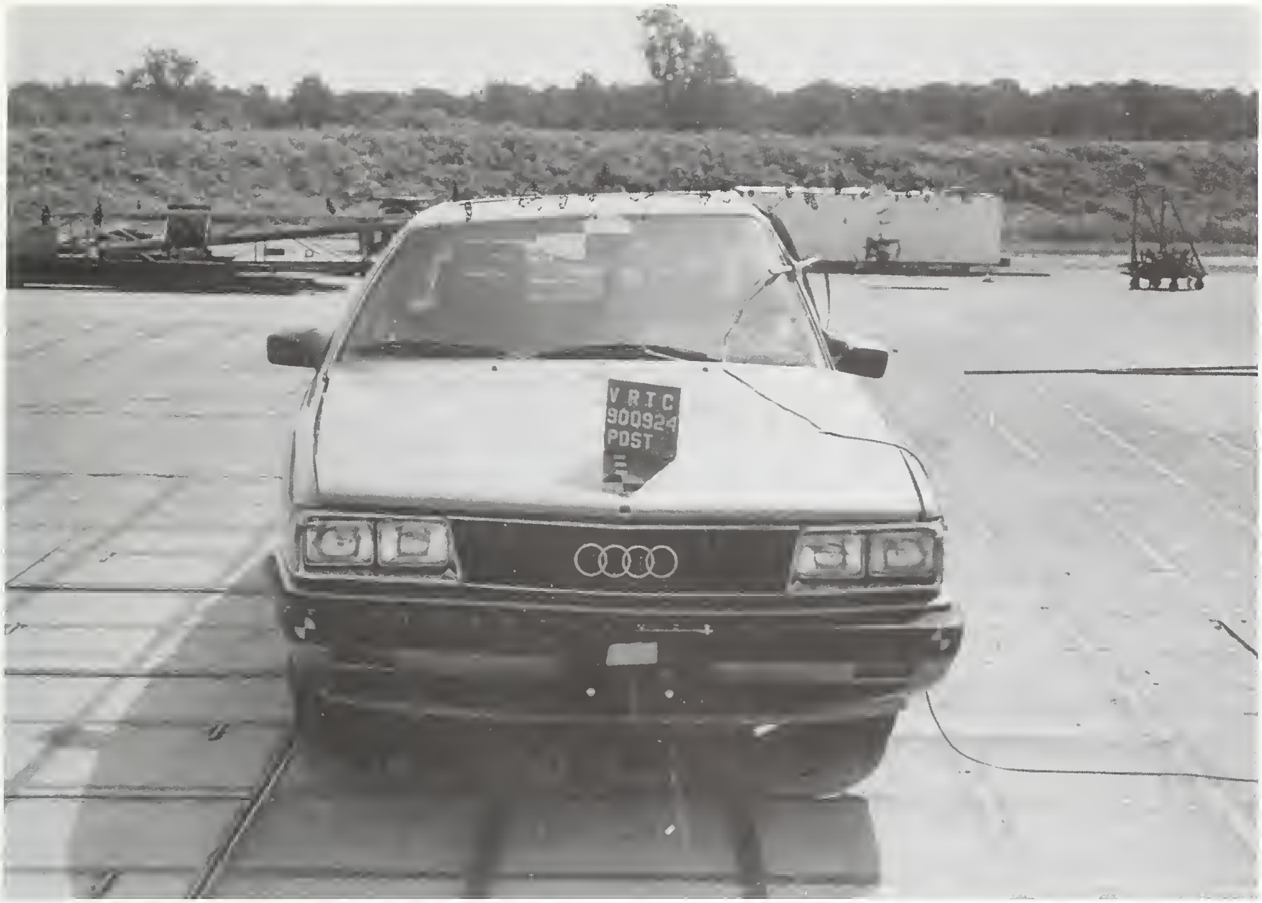


Figure A-17. POST-TEST OVERALL FRONT VIEW

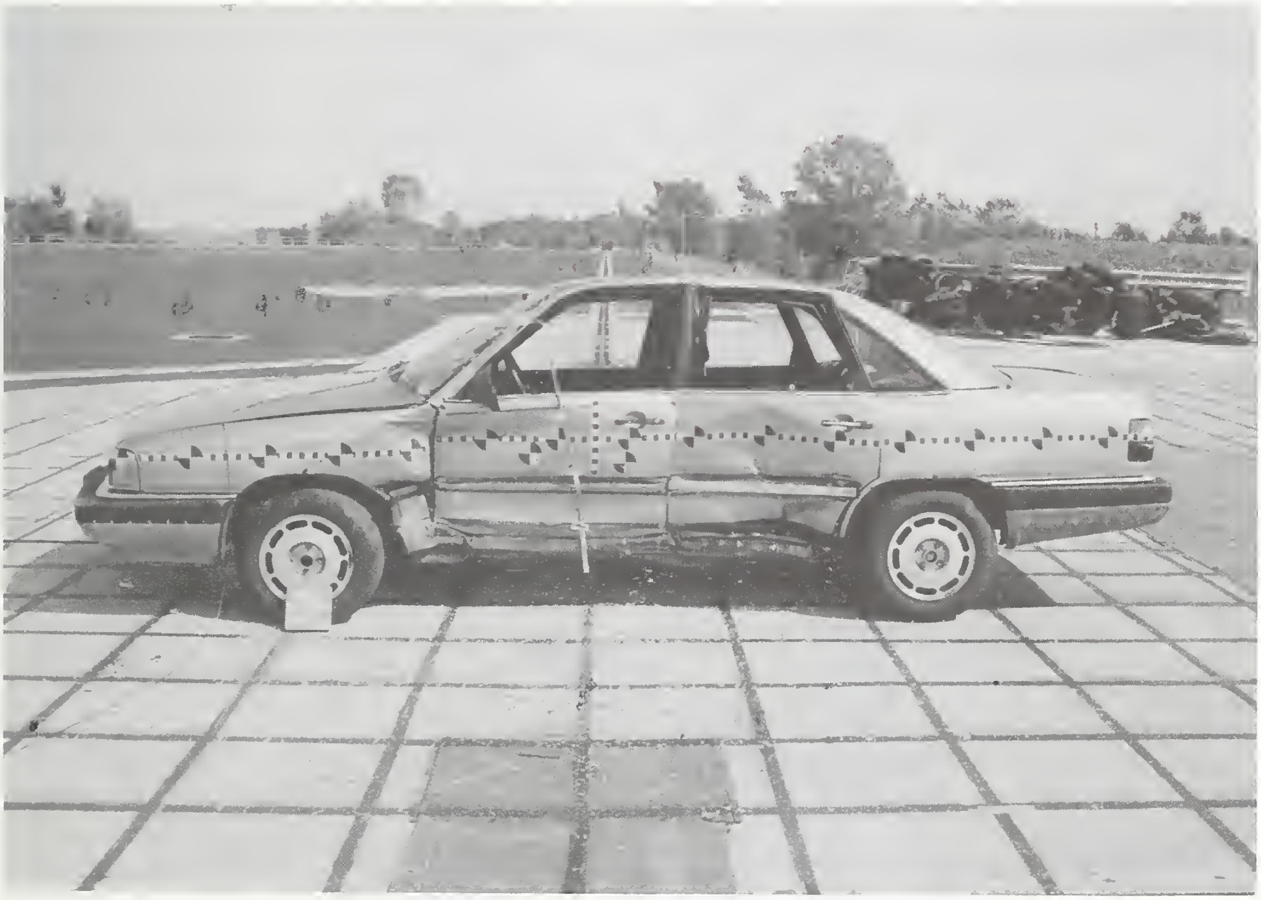


Figure A-18. POST-TEST OVERALL LEFT SIDE VIEW

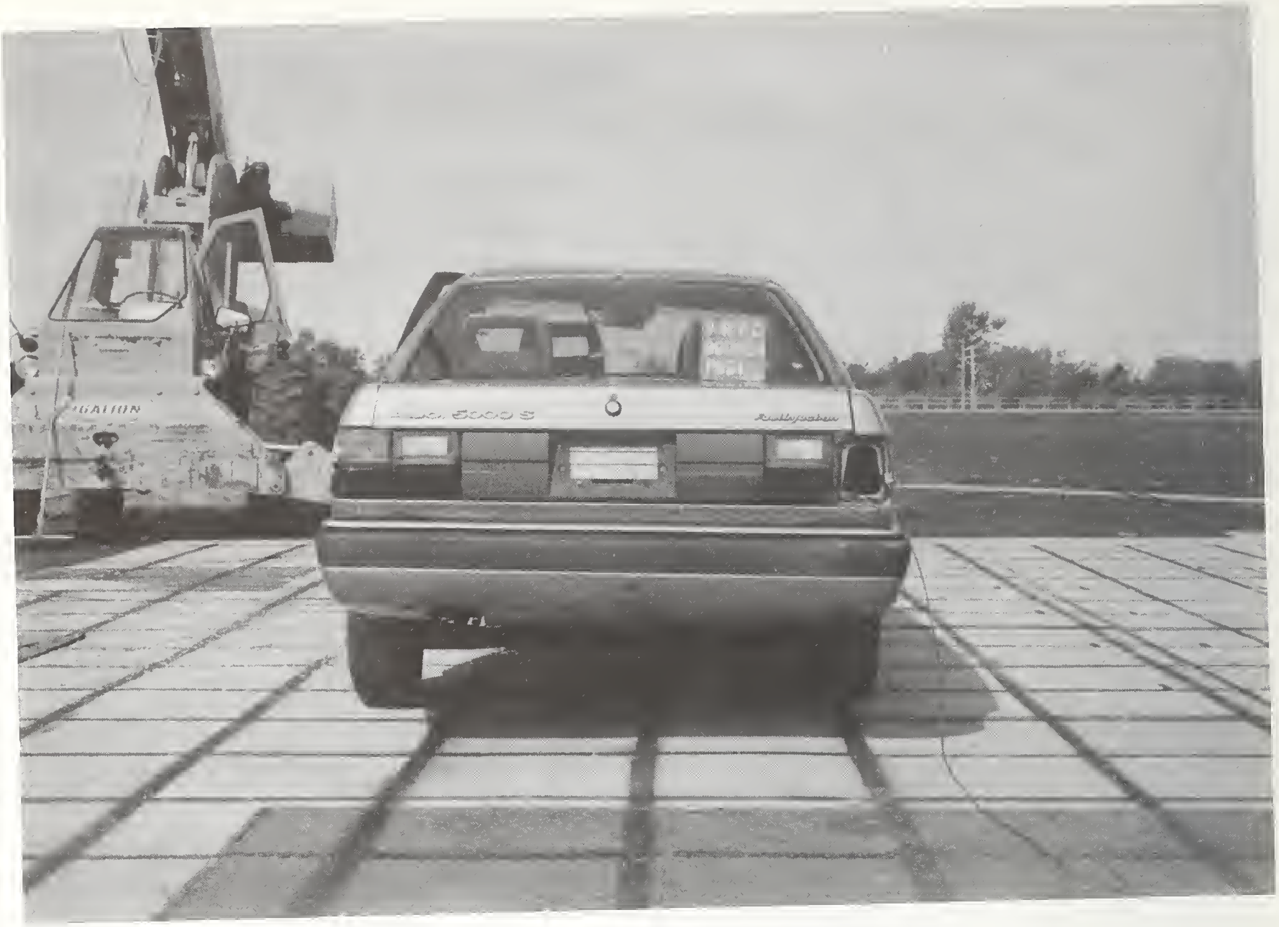


Figure A-19. POST-TEST OVERALL REAR VIEW

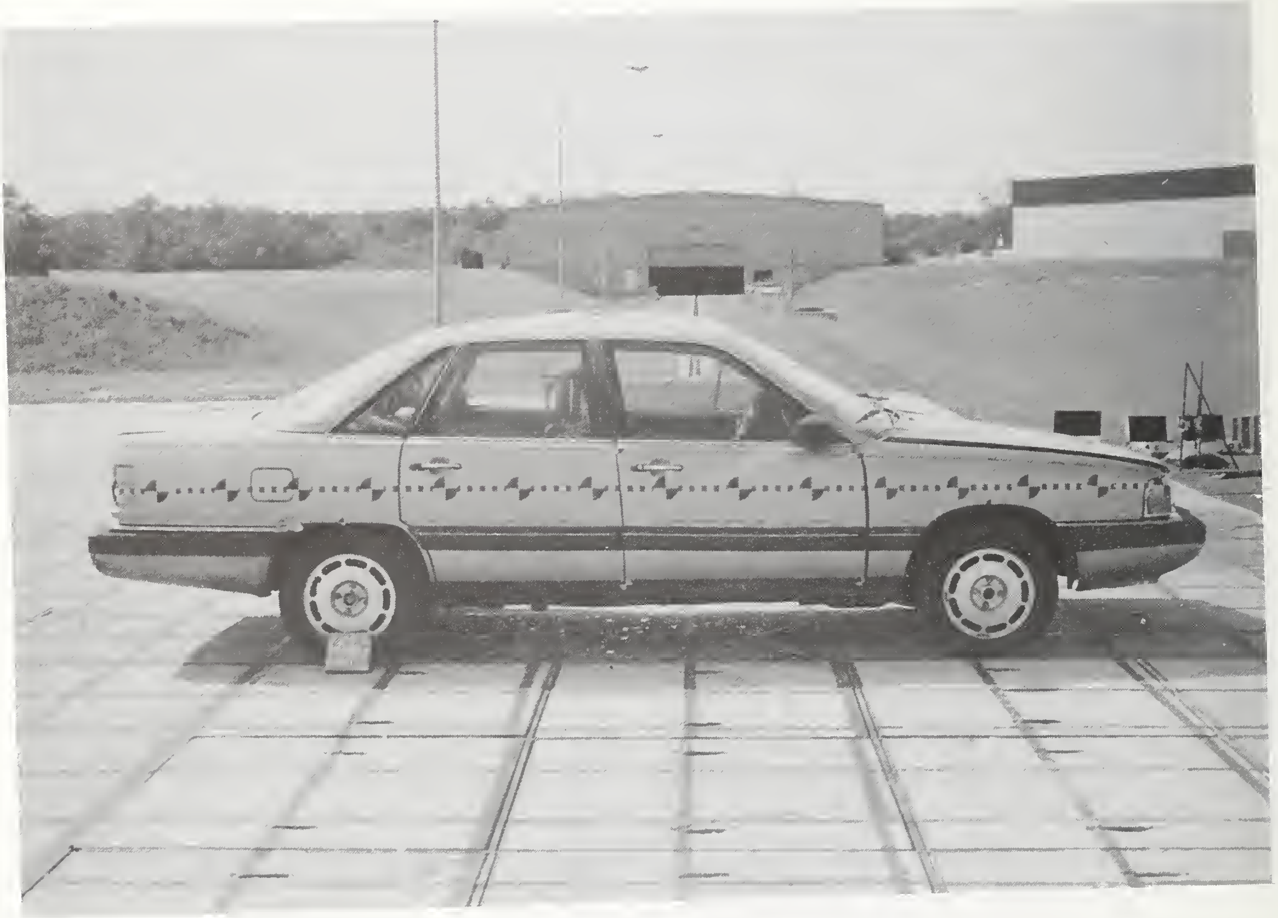


Figure A-20. POST-TEST OVERALL RIGHT SIDE VIEW

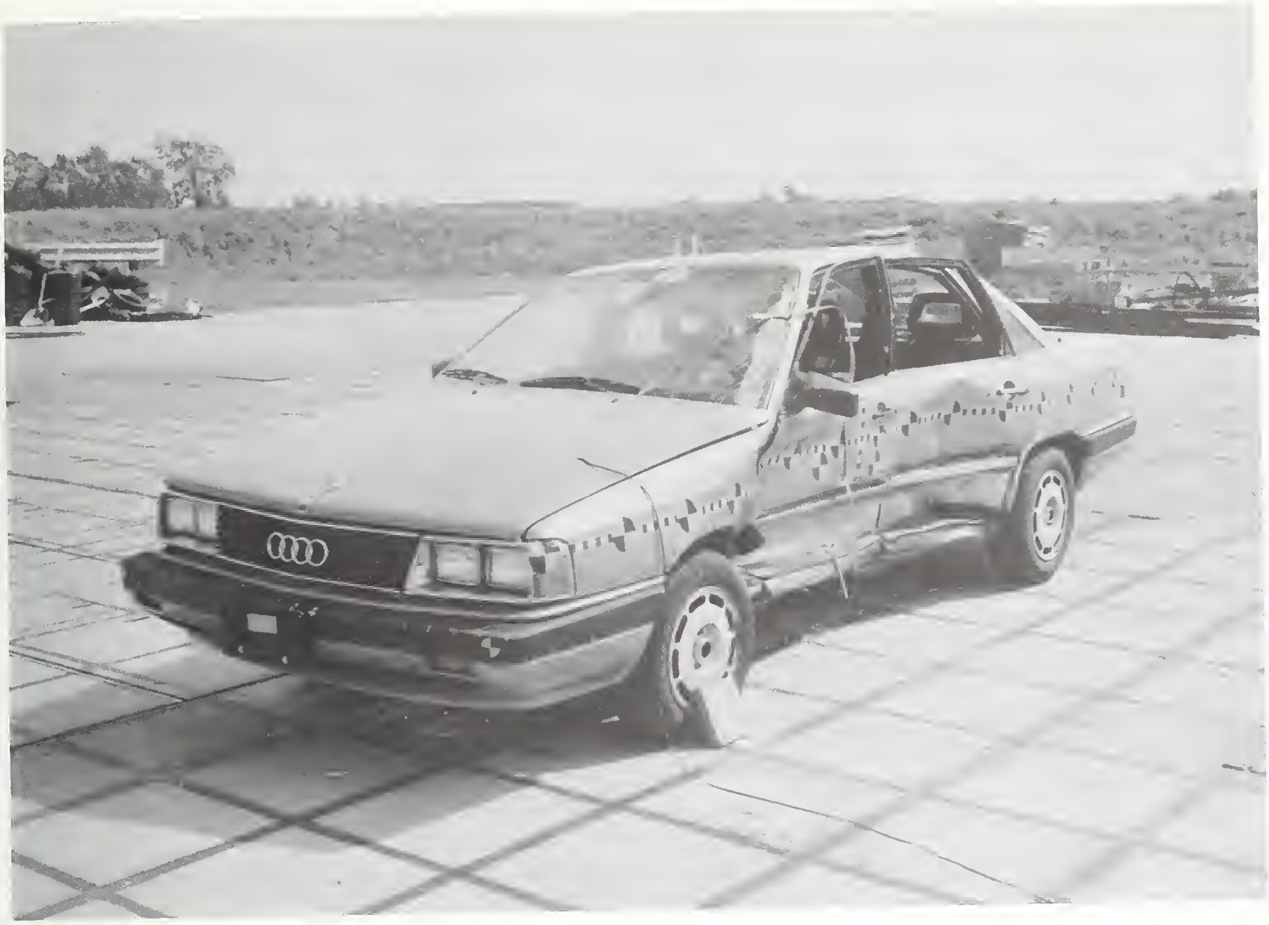


Figure A-21. POST-TEST LEFT FRONT THREE-QUARTER VIEW

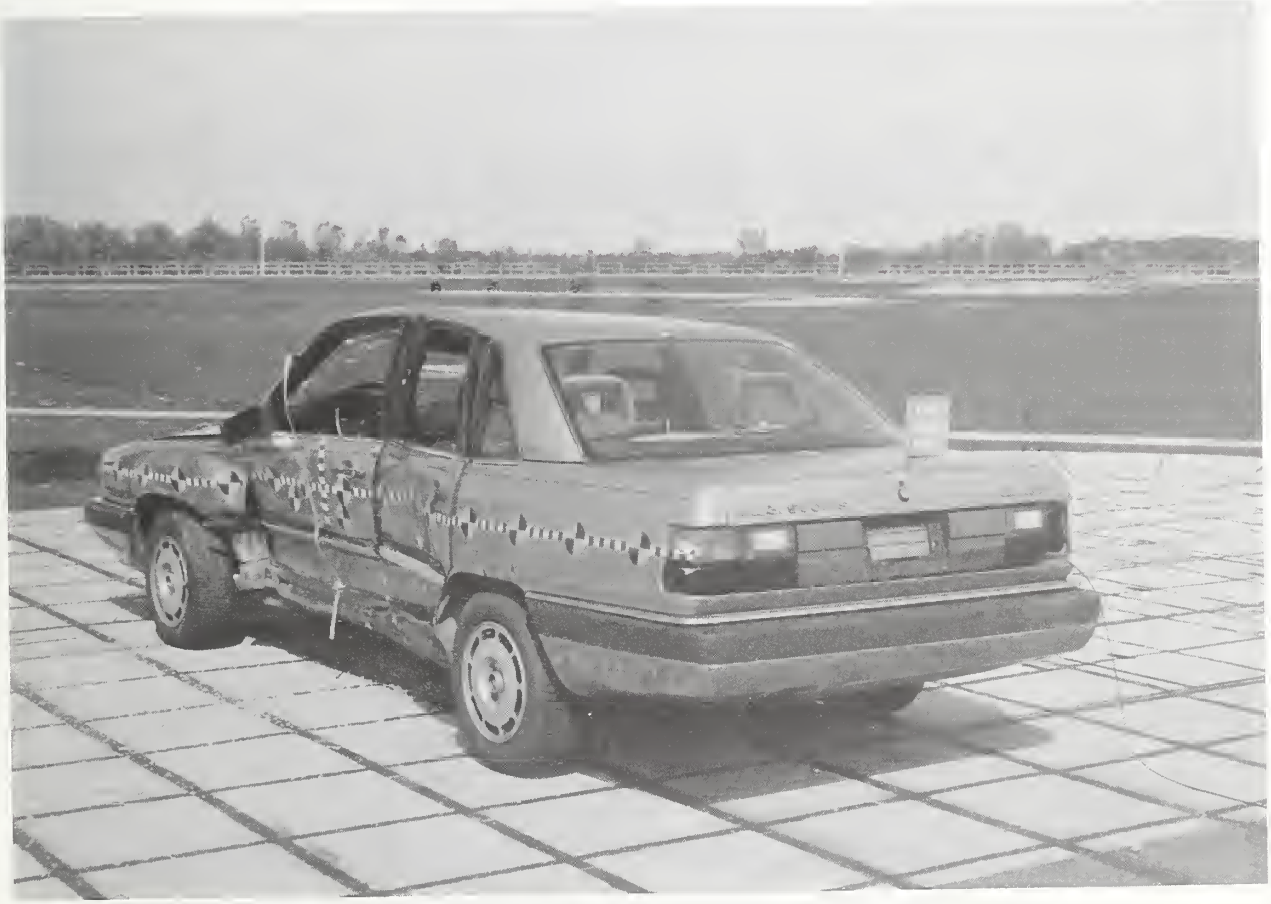


Figure A-22. POST-TEST LEFT REAR THREE-QUARTER VIEW

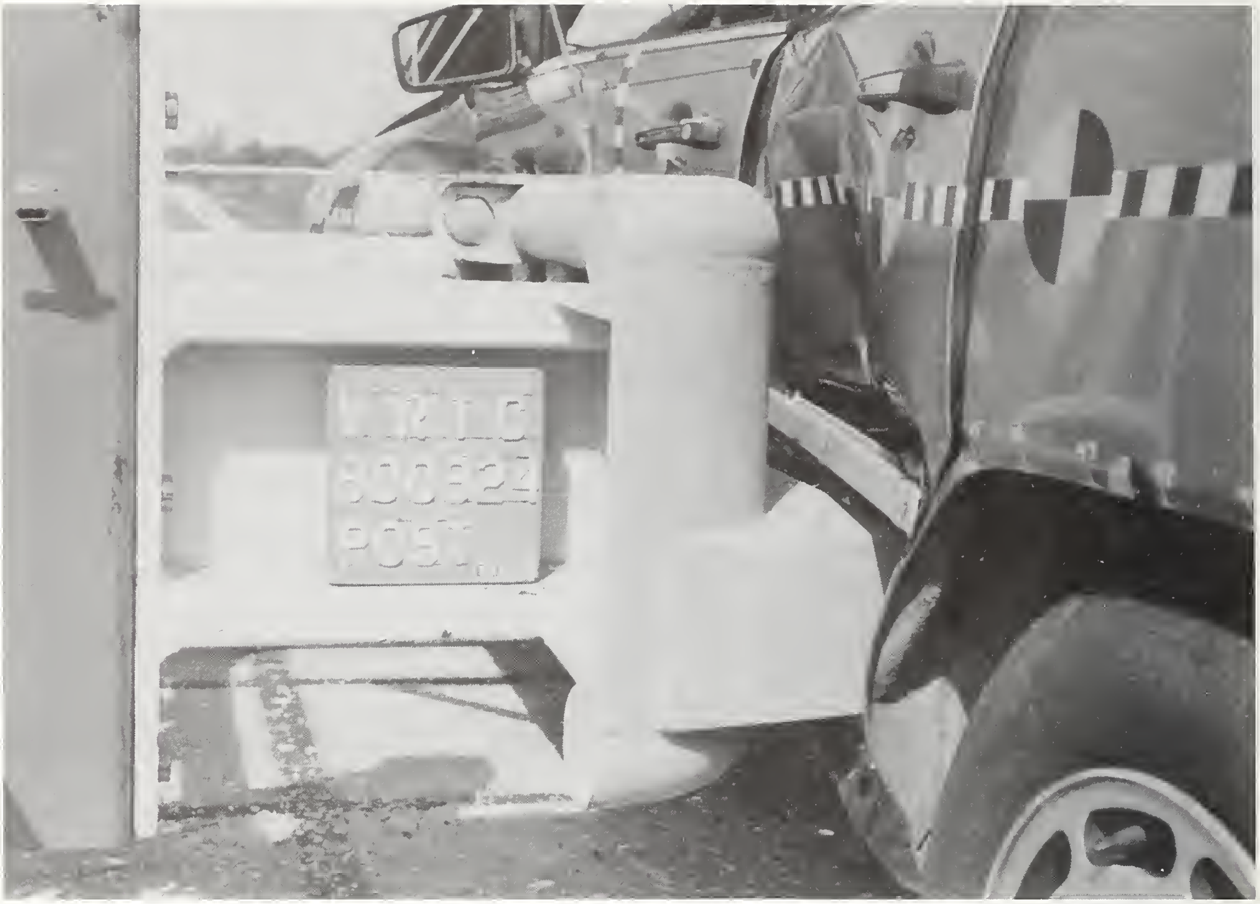


Figure A-23. POST-TEST CLOSE-UP LEFT REAR VIEW

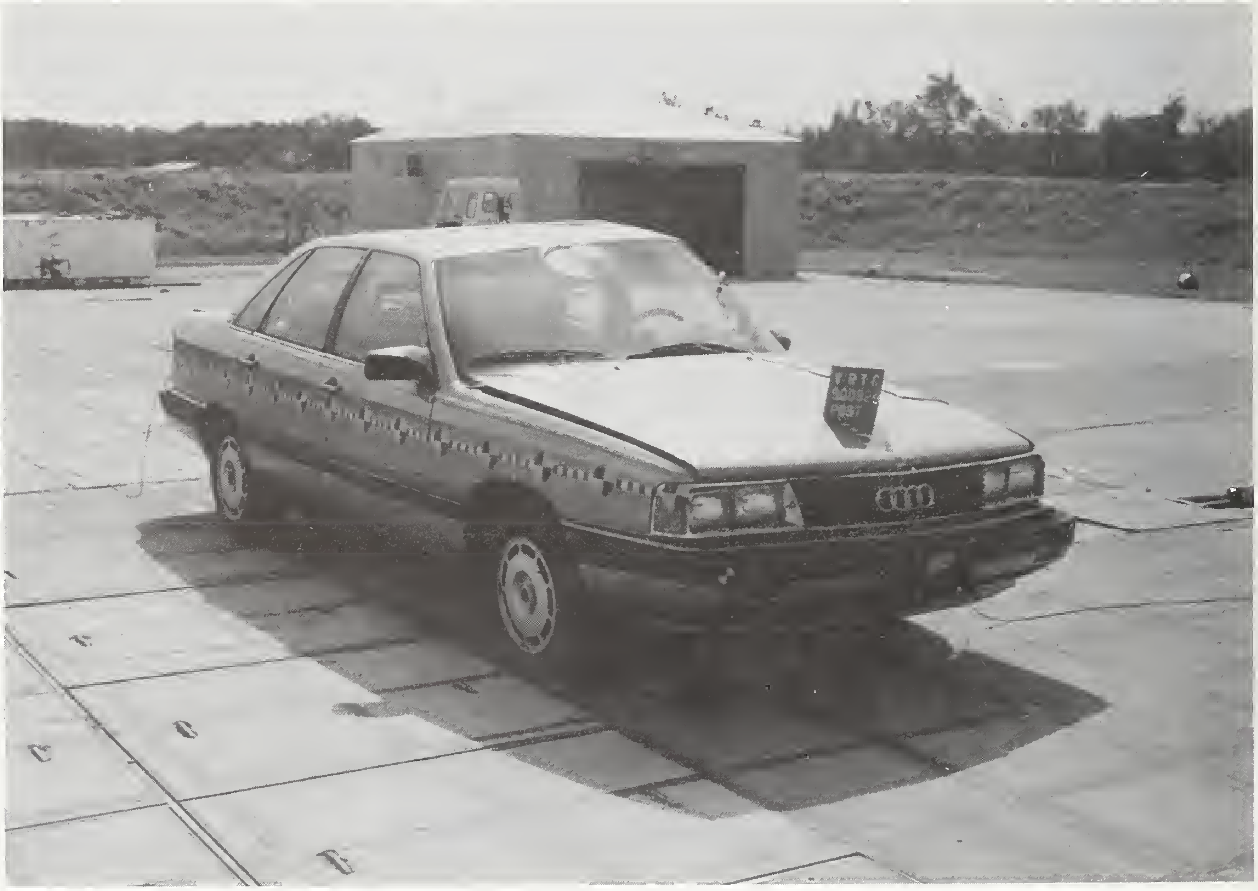


Figure A-24. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

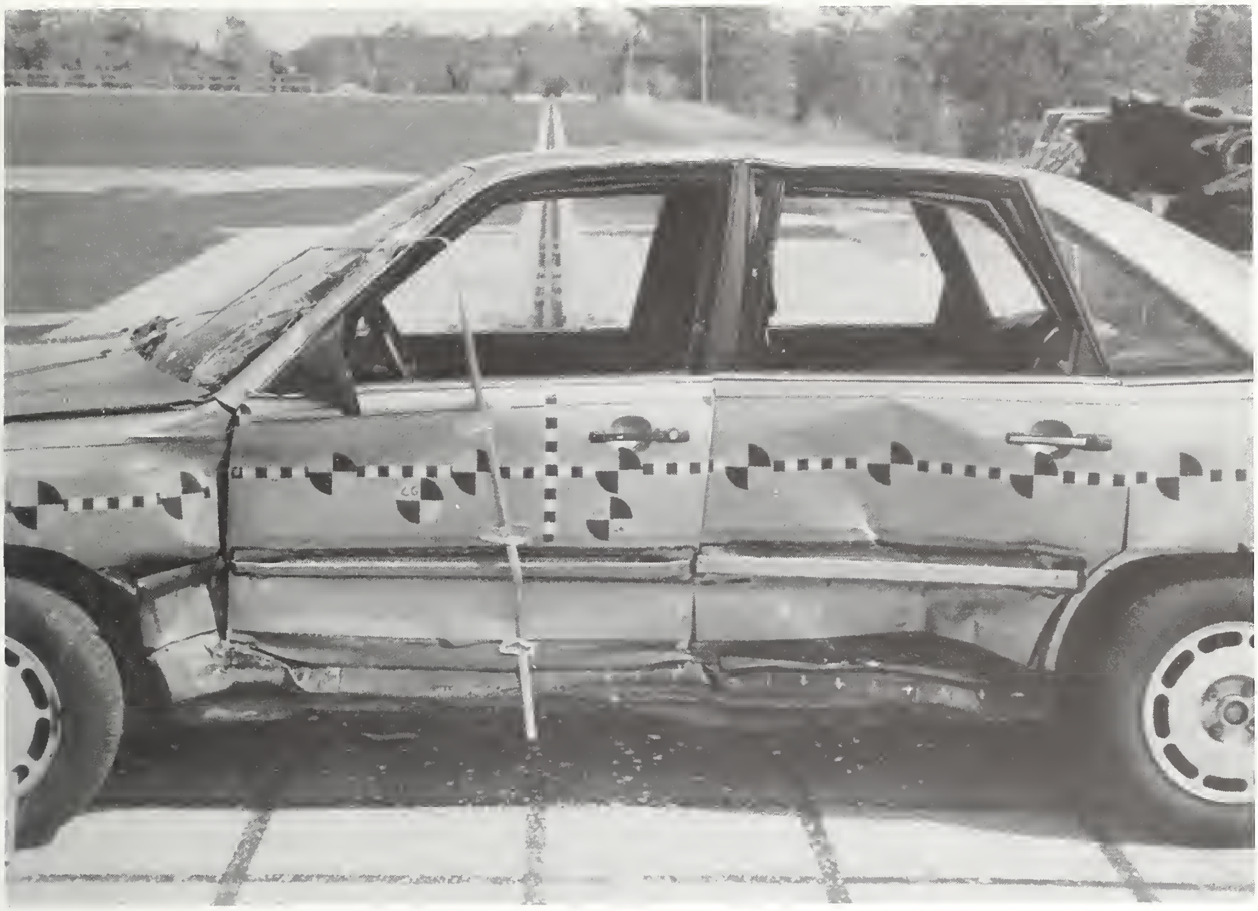


Figure A-25. POST-TEST LEFT SIDE CLOSE-UP VIEW

TEST #900925-1

LIST OF PHOTOGRAPHS

26. POST-TEST OVERALL FRONT VIEW
27. POST-TEST OVERALL LEFT SIDE VIEW
28. POST-TEST OVERALL REAR VIEW
29. POST-TEST OVERALL RIGHT SIDE VIEW
30. POST-TEST LEFT FRONT THREE-QUARTER VIEW
31. POST-TEST LEFT REAR THREE-QUARTER VIEW
32. POST-TEST CLOSE-UP LEFT REAR VIEW
33. POST-TEST LEFT SIDE CLOSE-UP VIEW
34. POST-TEST SET-UP DEVICE MEASUREMENTS - VIEW 1
35. POST-TEST SET-UP DEVICE MEASUREMENTS - VIEW 2

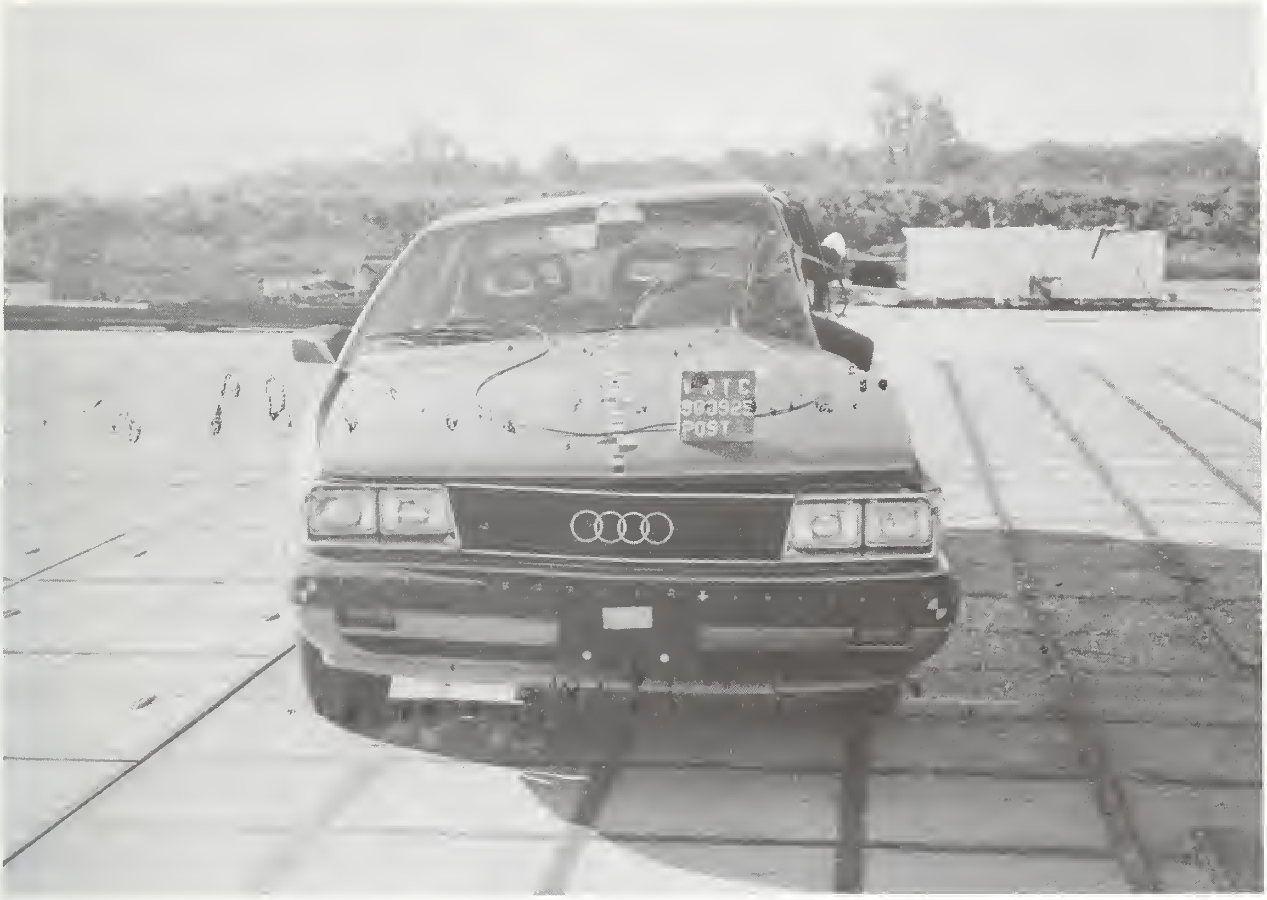


Figure A-26. POST-TEST OVERALL FRONT VIEW

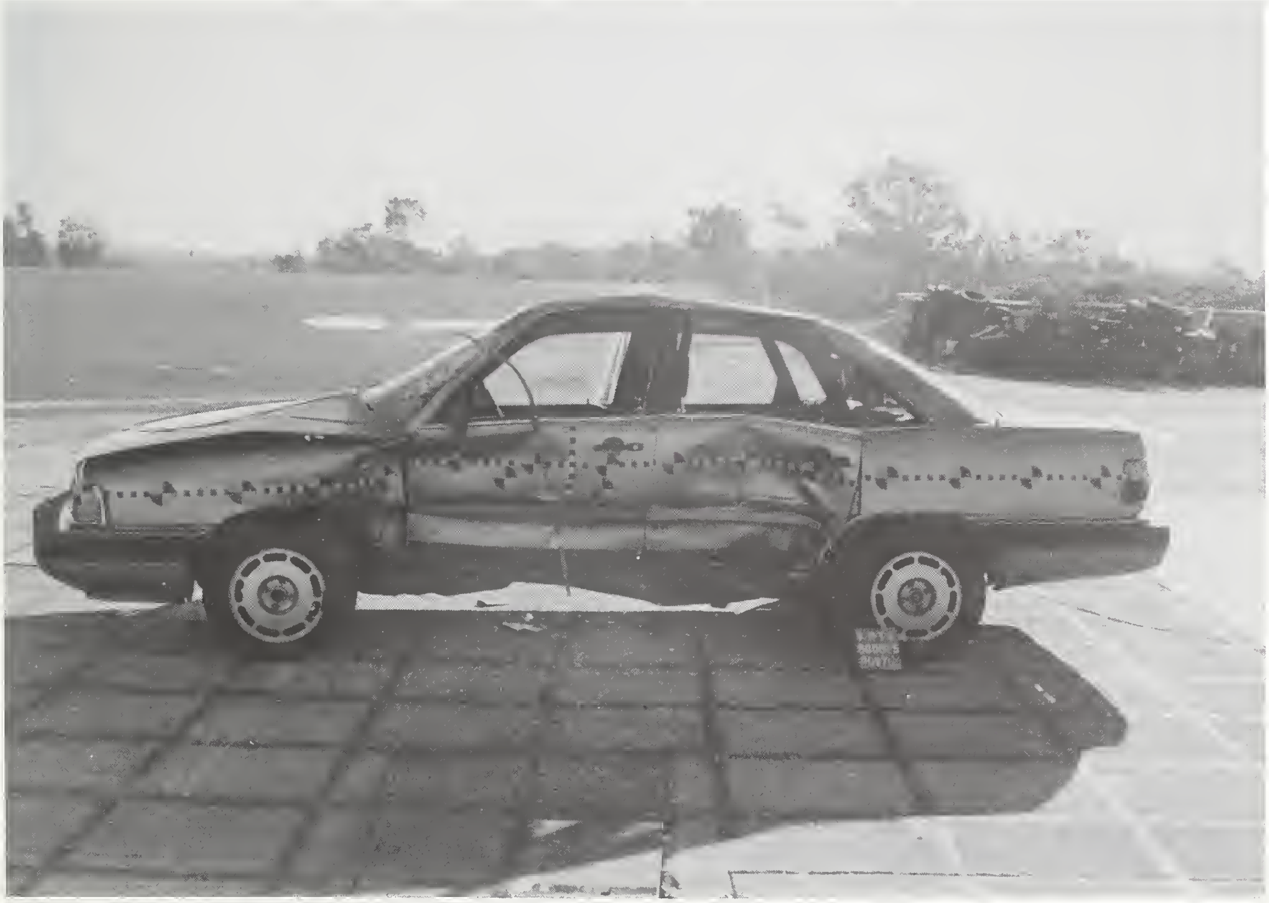


Figure A-27. POST-TEST OVERALL LEFT SIDE VIEW

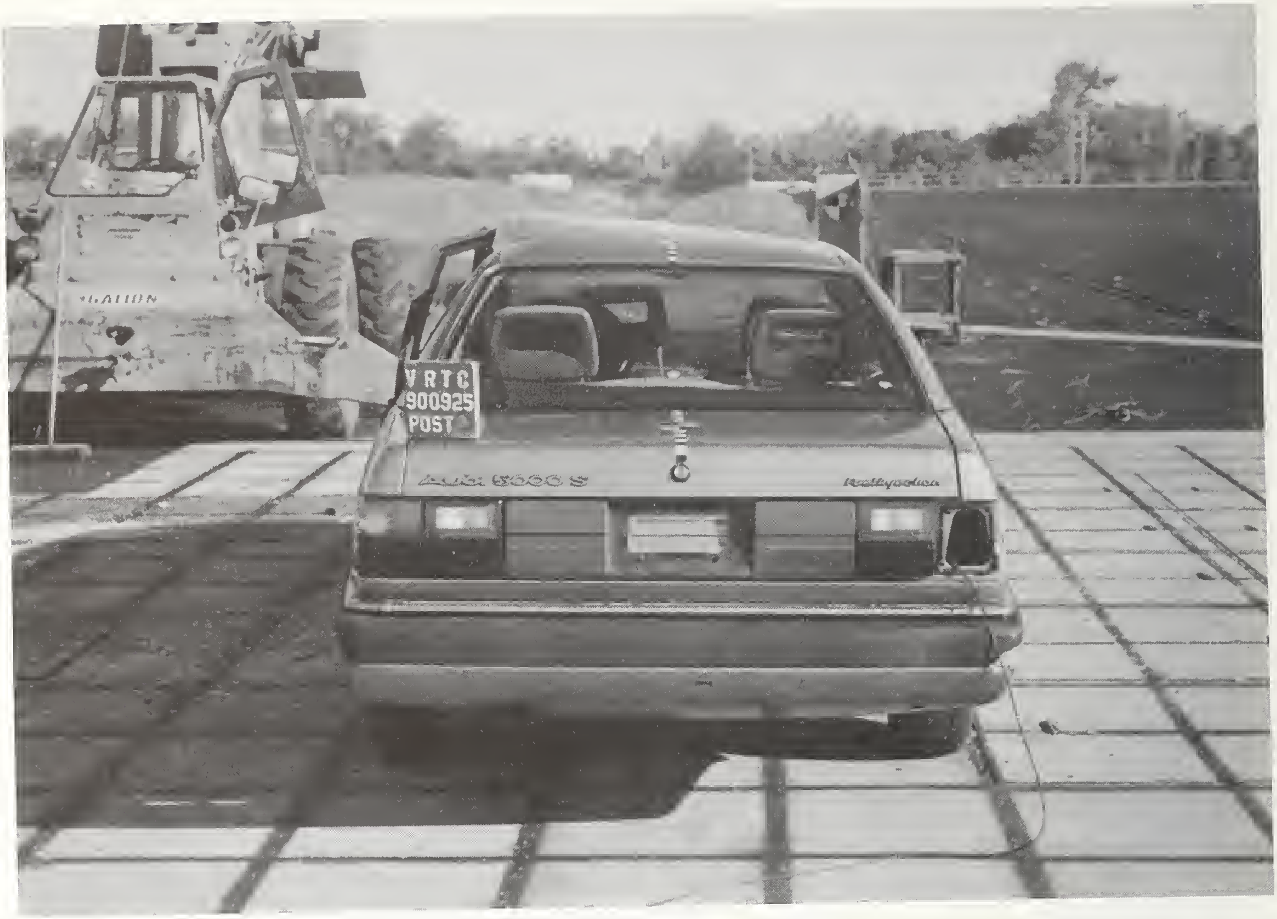


Figure A-28. POST-TEST OVERALL REAR VIEW

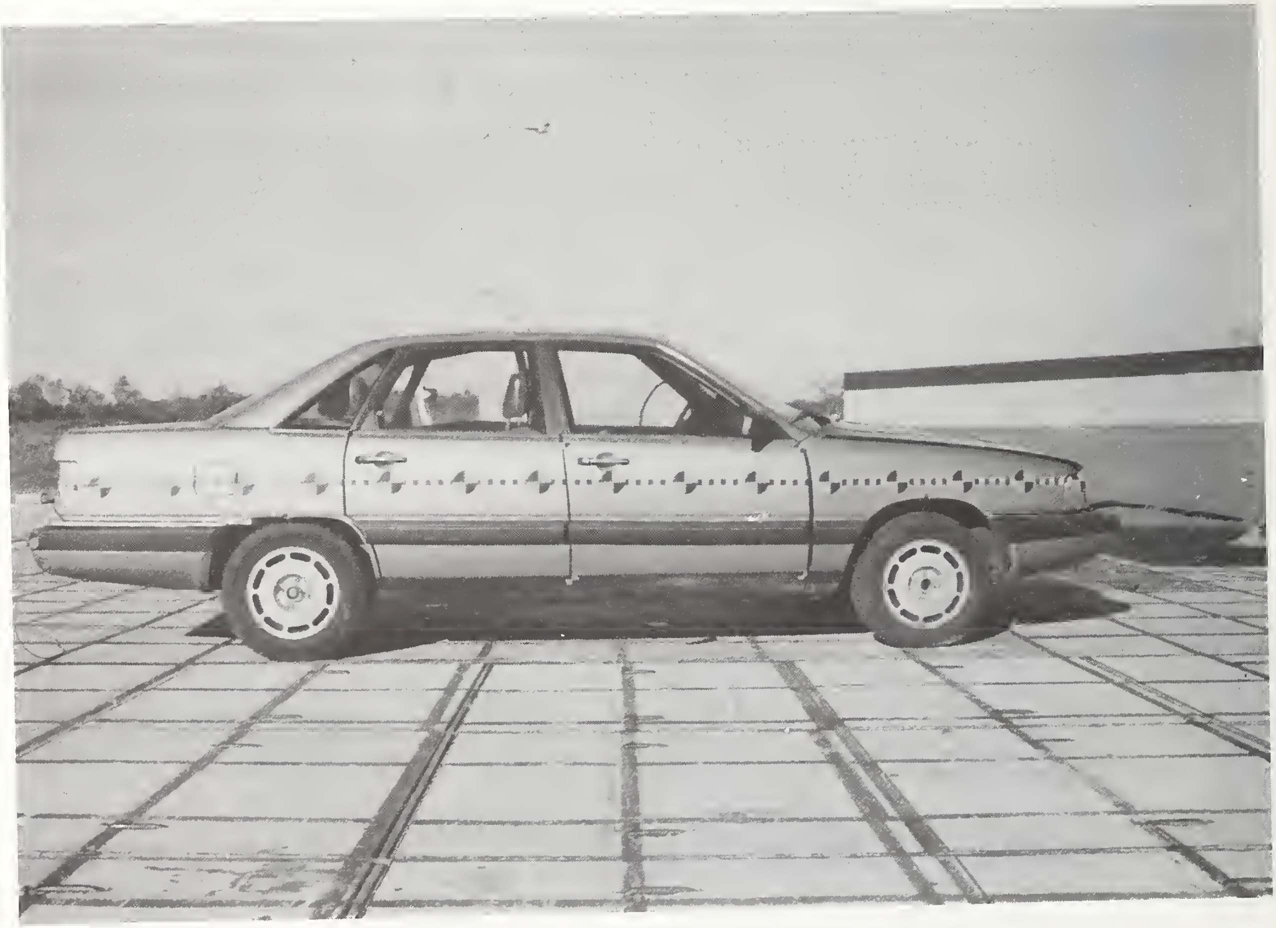


Figure A-29. POST-TEST OVERALL RIGHT SIDE VIEW

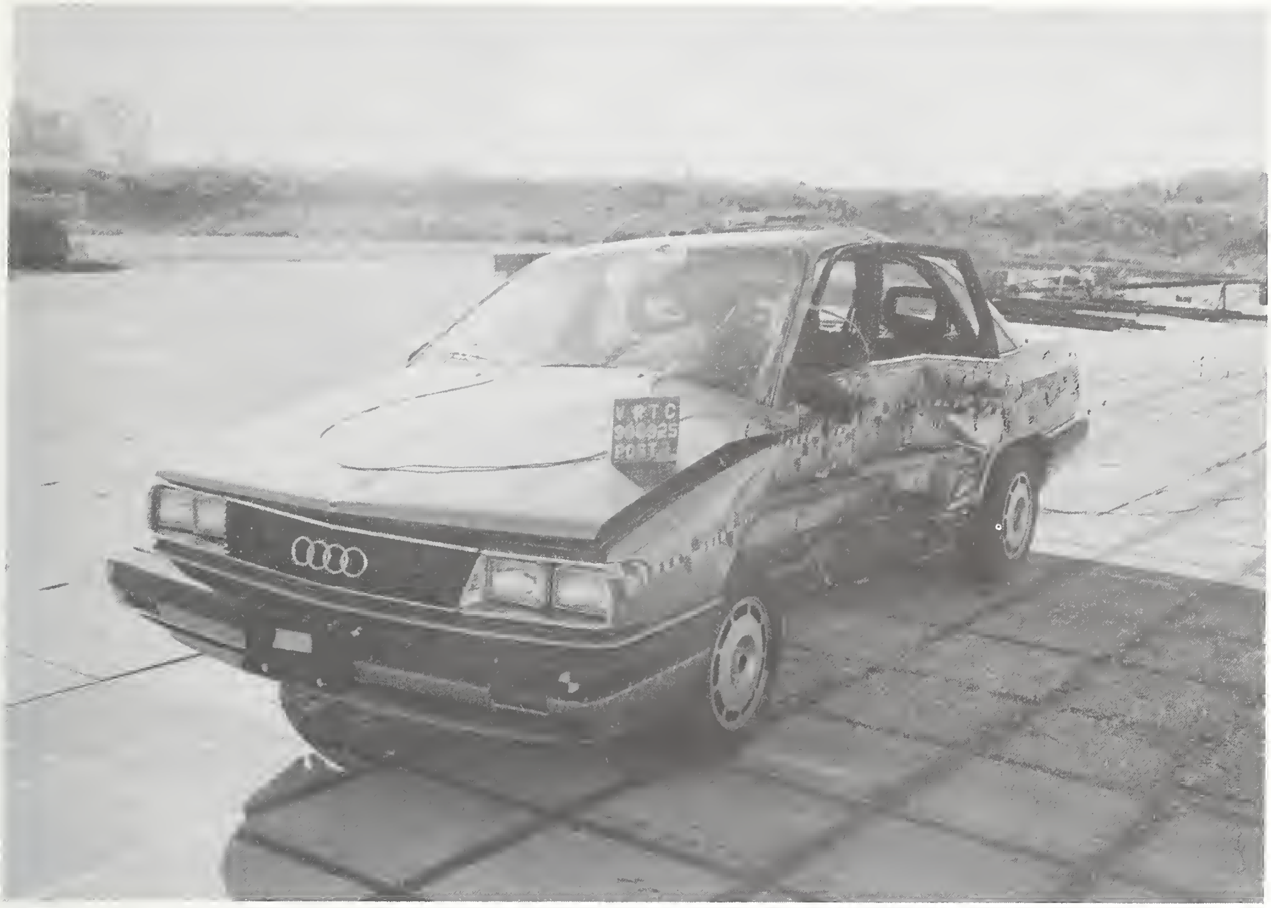


Figure A-30. POST-TEST LEFT FRONT THREE-QUARTER VIEW

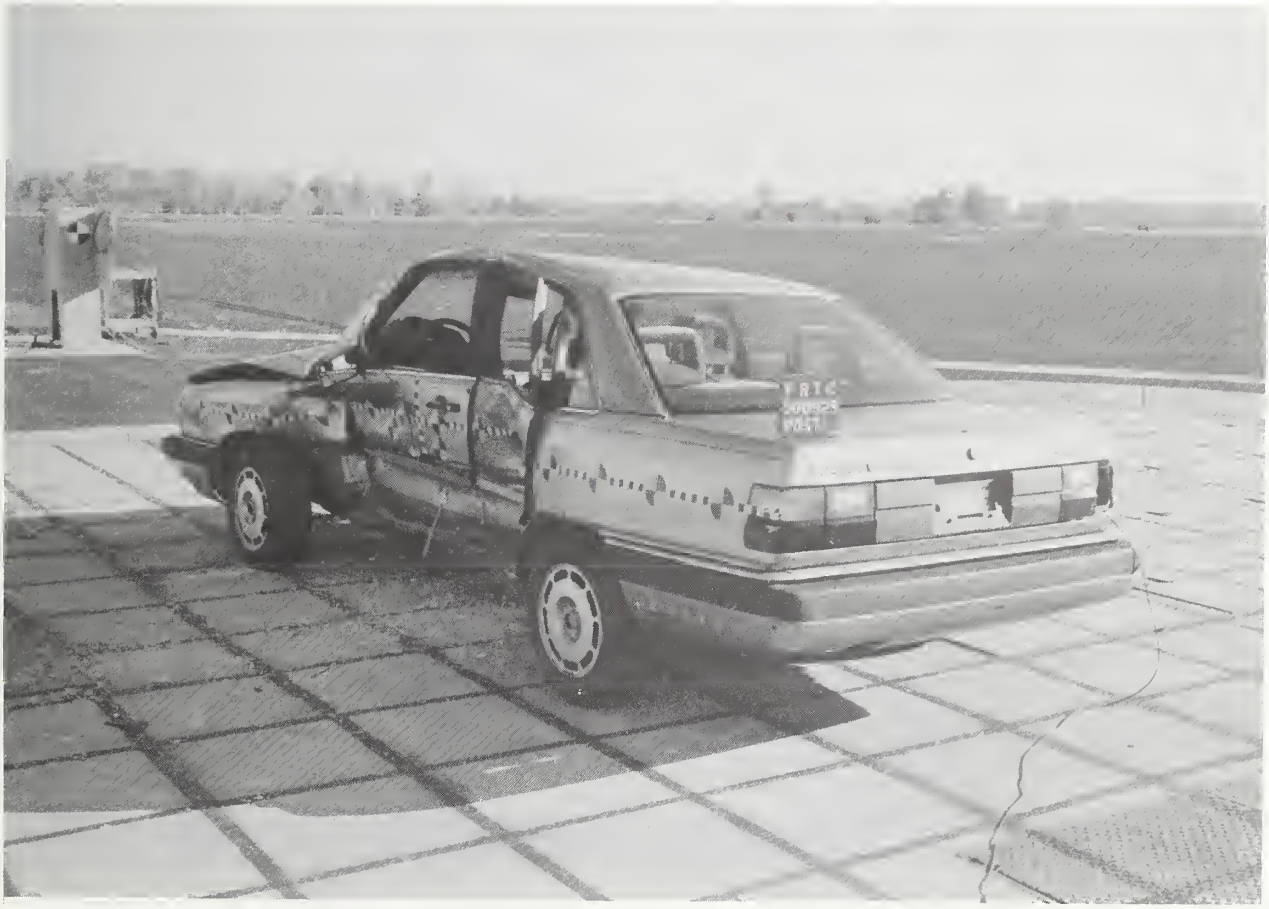


Figure A-31. POST-TEST LEFT REAR THREE-QUARTER VIEW

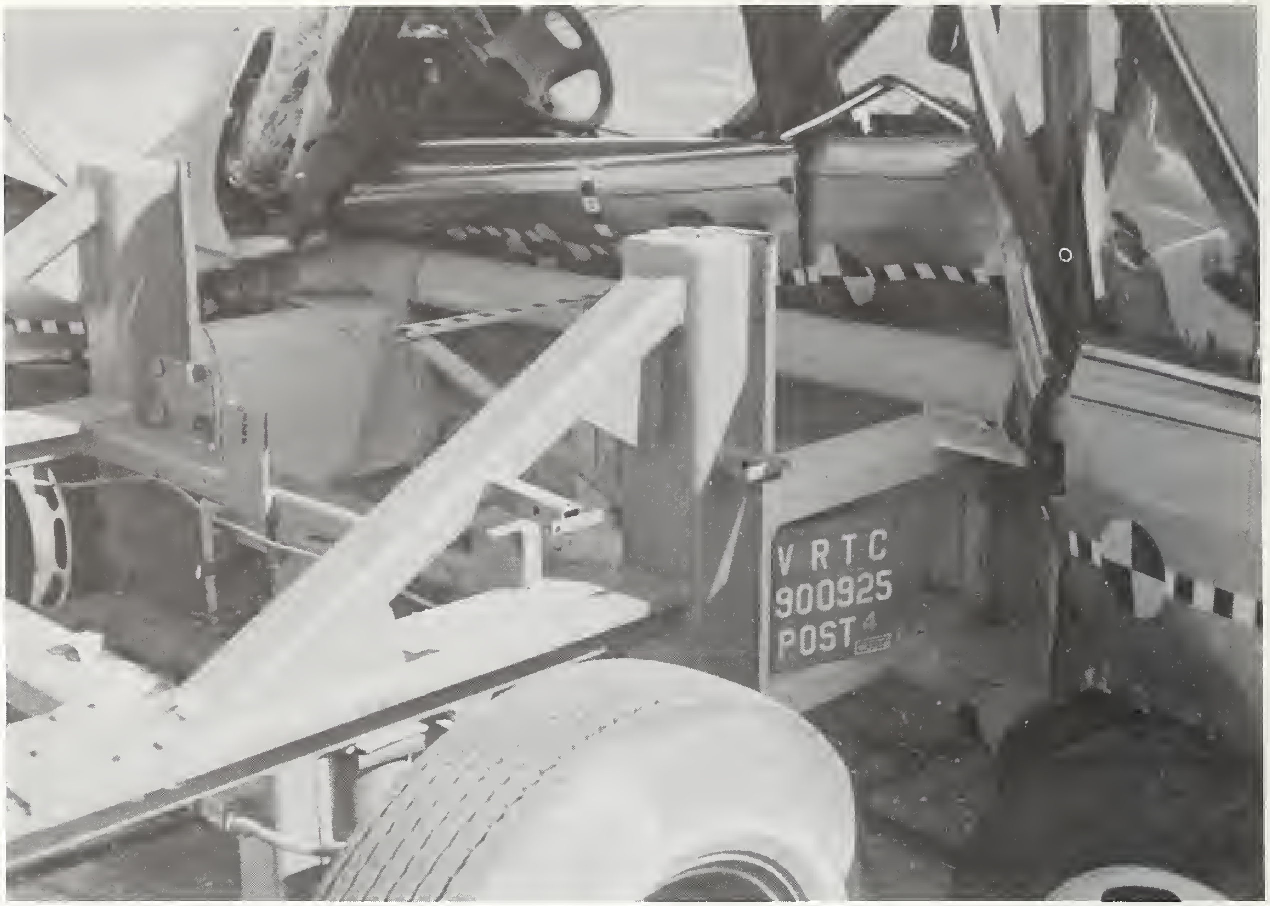


Figure A-32. POST-TEST CLOSE-UP LEFT REAR VIEW

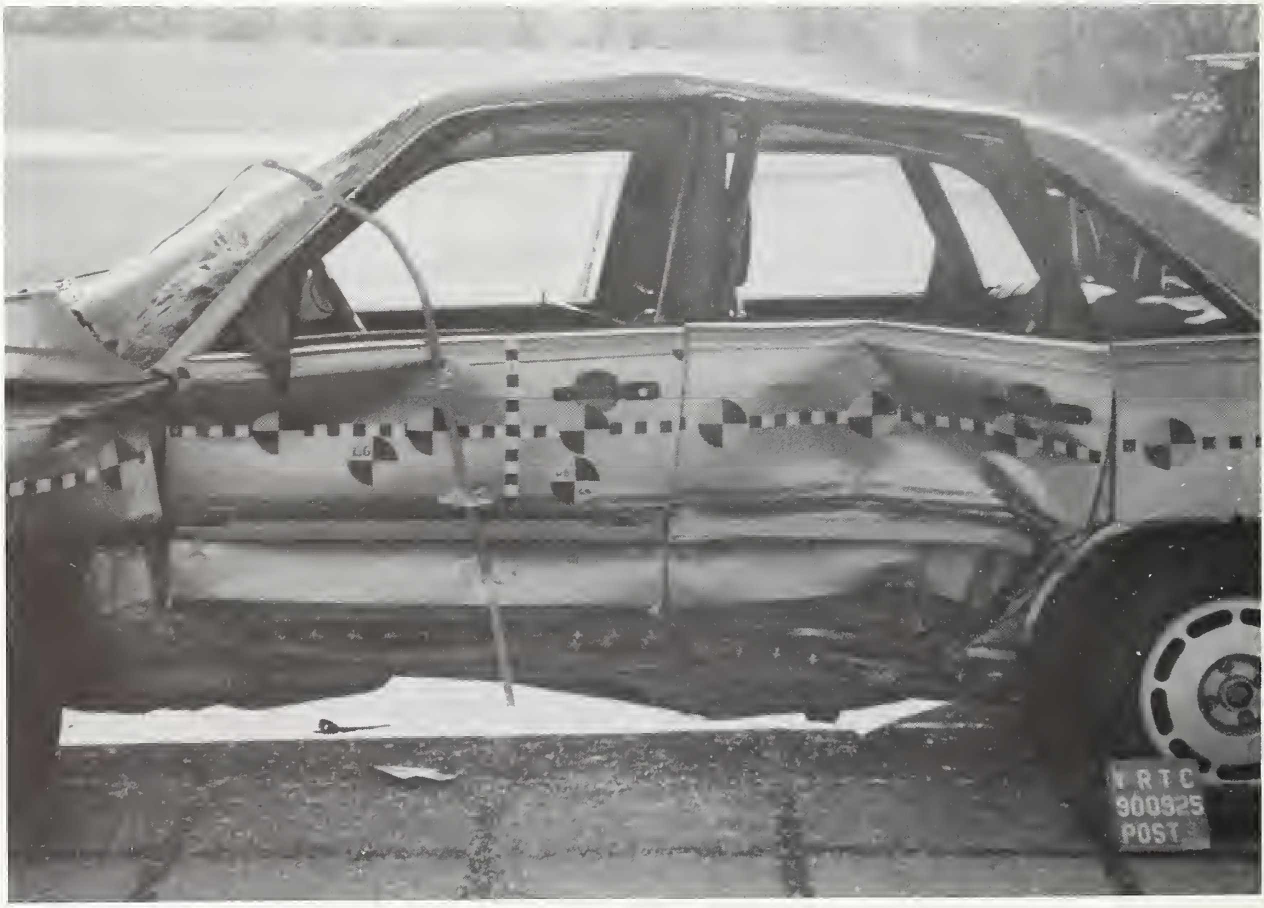


Figure A-33. POST-TEST LEFT SIDE CLOSE-UP VIEW

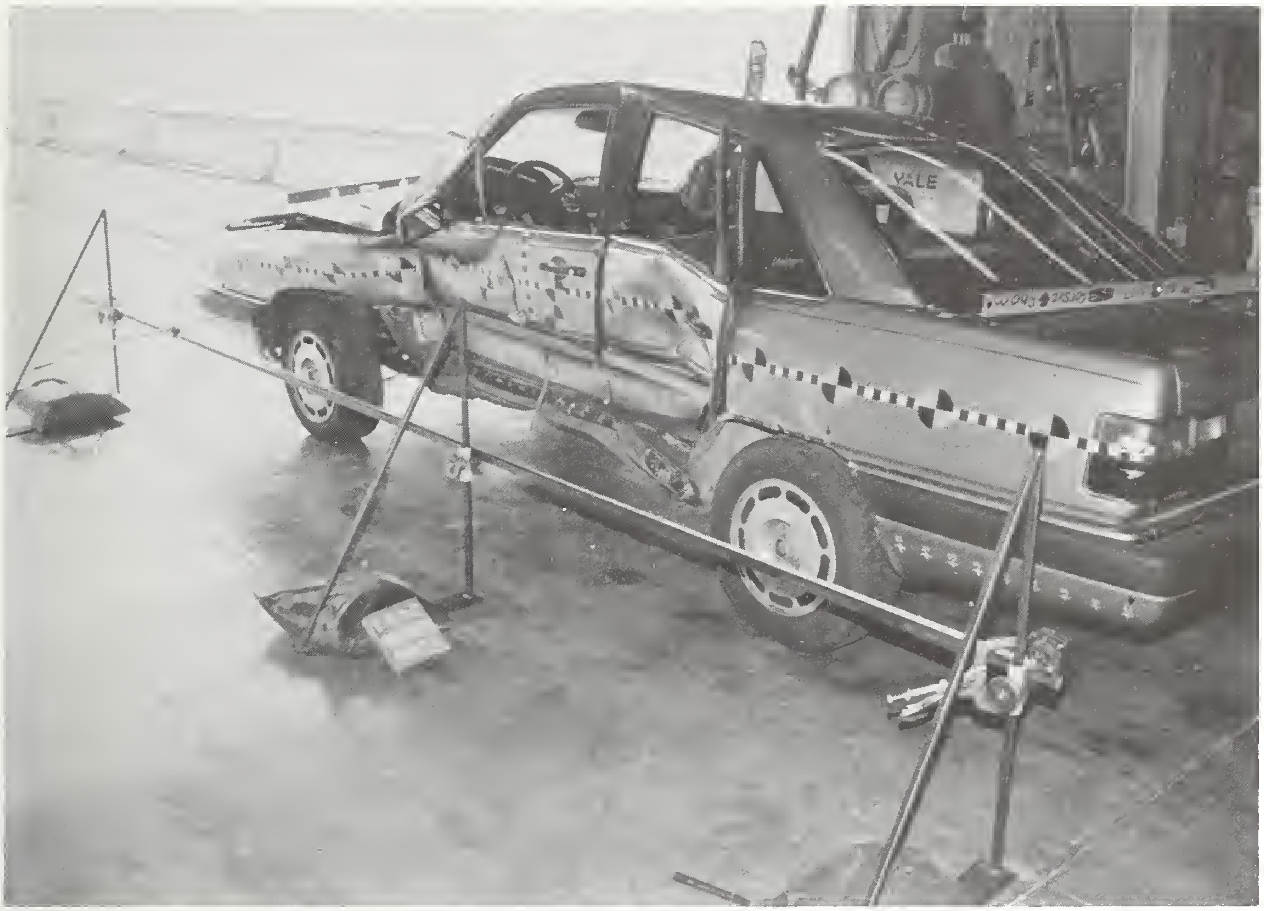


Figure A-34. POST-TEST SET-UP DEVICE MEASUREMENTS - VIEW 1

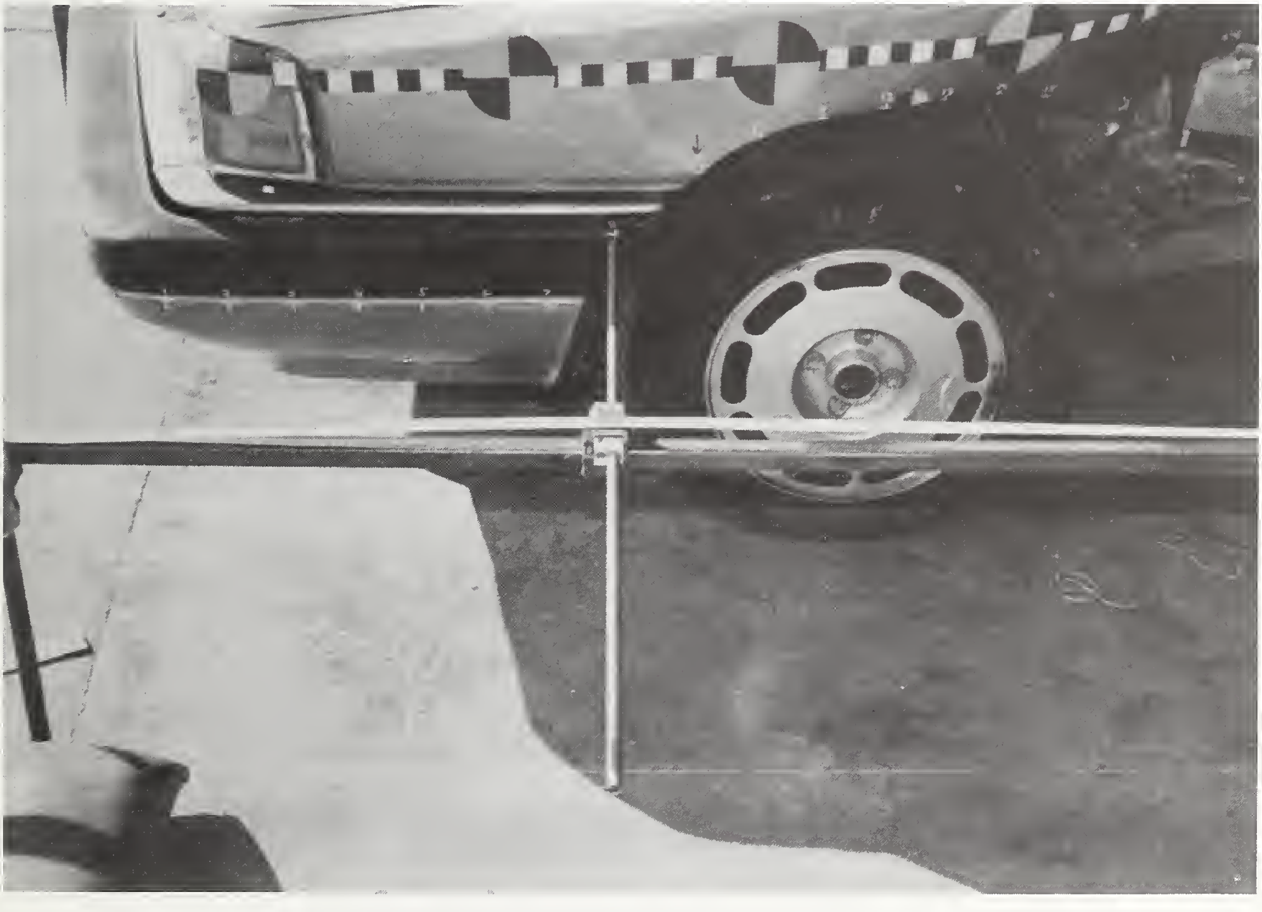


Figure A-35. POST-TEST SET-UP DEVICE MEASUREMENTS - VIEW 2

TEST #900925-2

LIST OF PHOTOGRAPHS

36. POST-TEST OVERALL FRONT VIEW
37. POST-TEST OVERALL LEFT SIDE VIEW
38. POST-TEST OVERALL REAR VIEW
39. POST-TEST OVERALL RIGHT SIDE VIEW
40. POST-TEST LEFT FRONT THREE-QUARTER VIEW
41. POST-TEST LEFT REAR THREE-QUARTER VIEW
42. POST-TEST CLOSE-UP LEFT REAR VIEW
43. POST-TEST LEFT SIDE CLOSE-UP VIEW

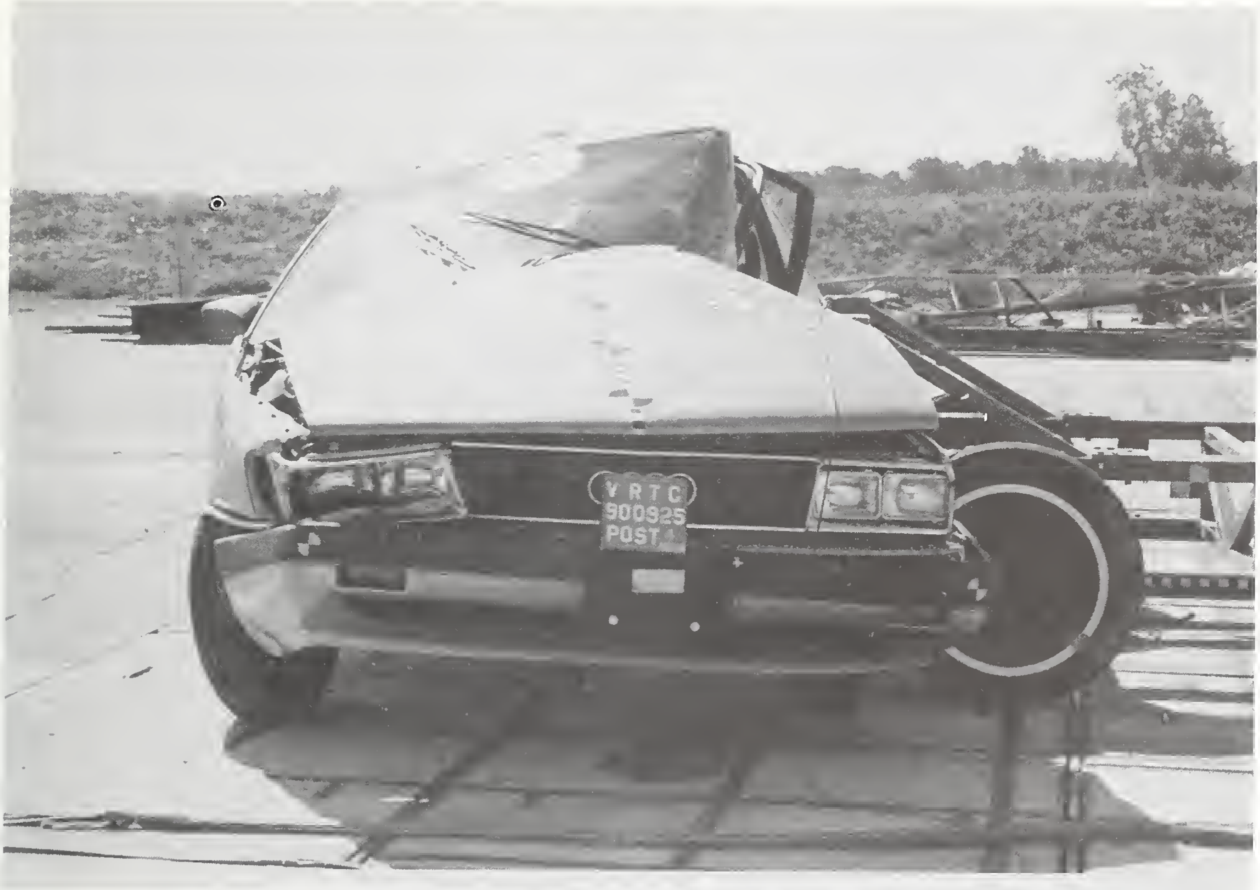


Figure A-36. POST-TEST OVERALL FRONT VIEW

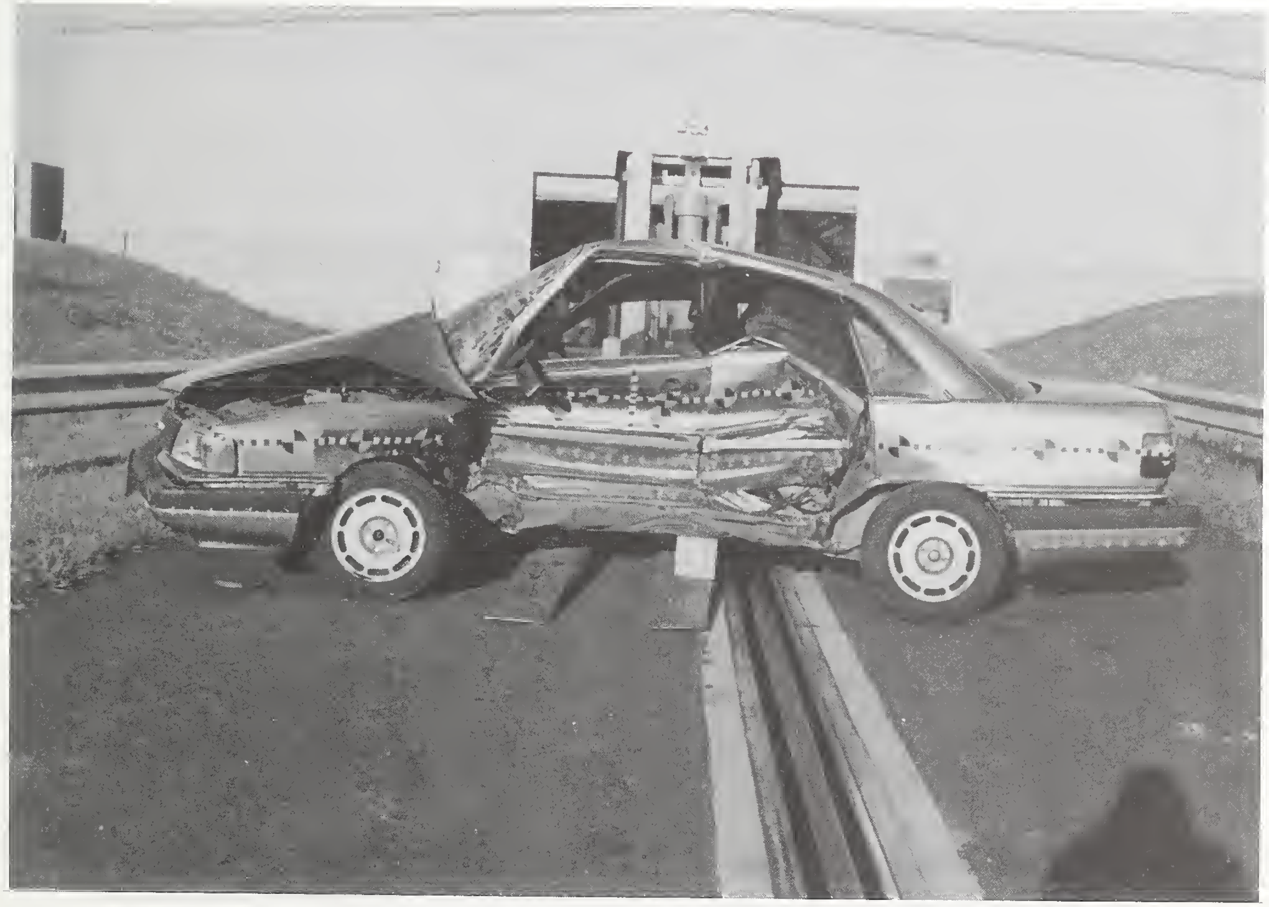


Figure A-37. POST-TEST OVERALL LEFT SIDE VIEW

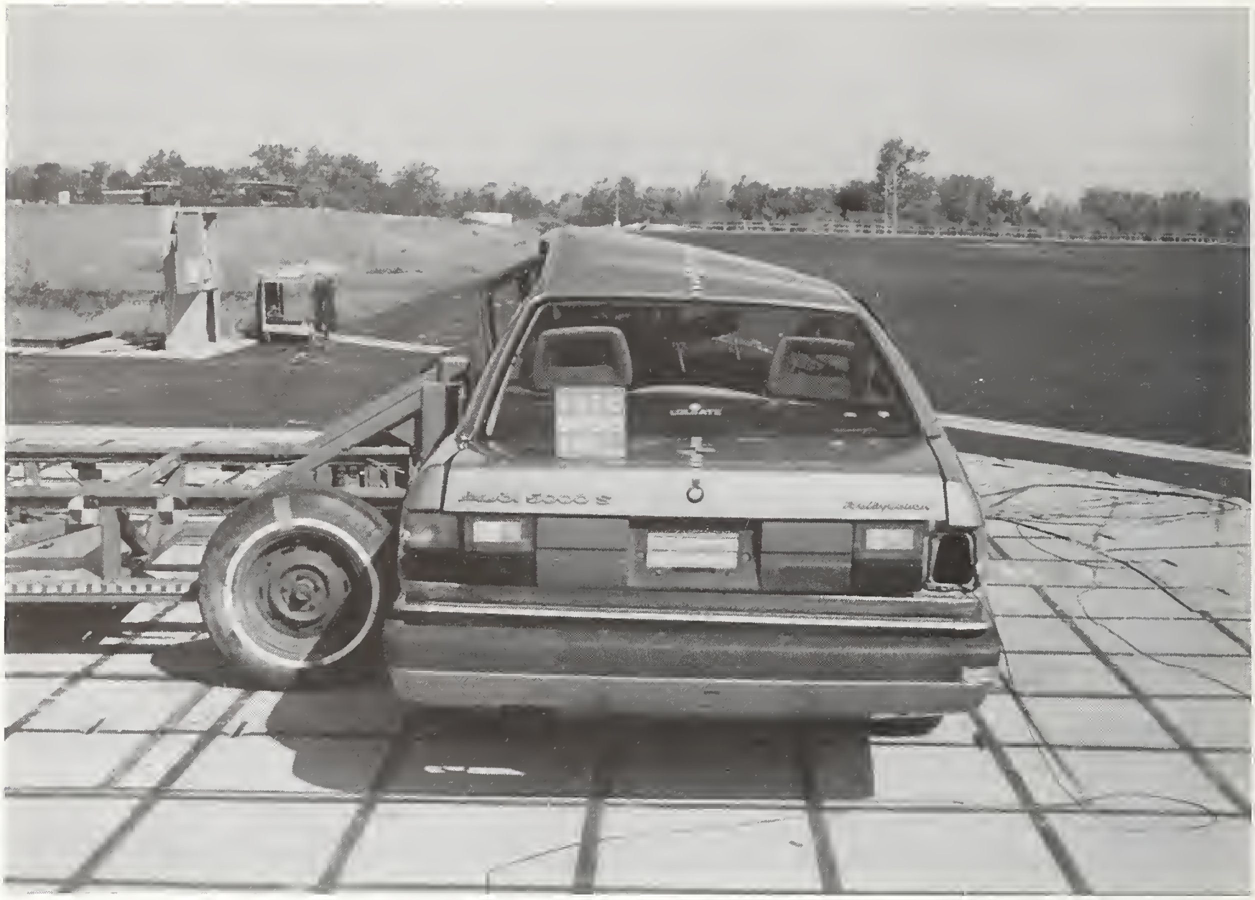


Figure A-38. POST-TEST OVERALL REAR VIEW

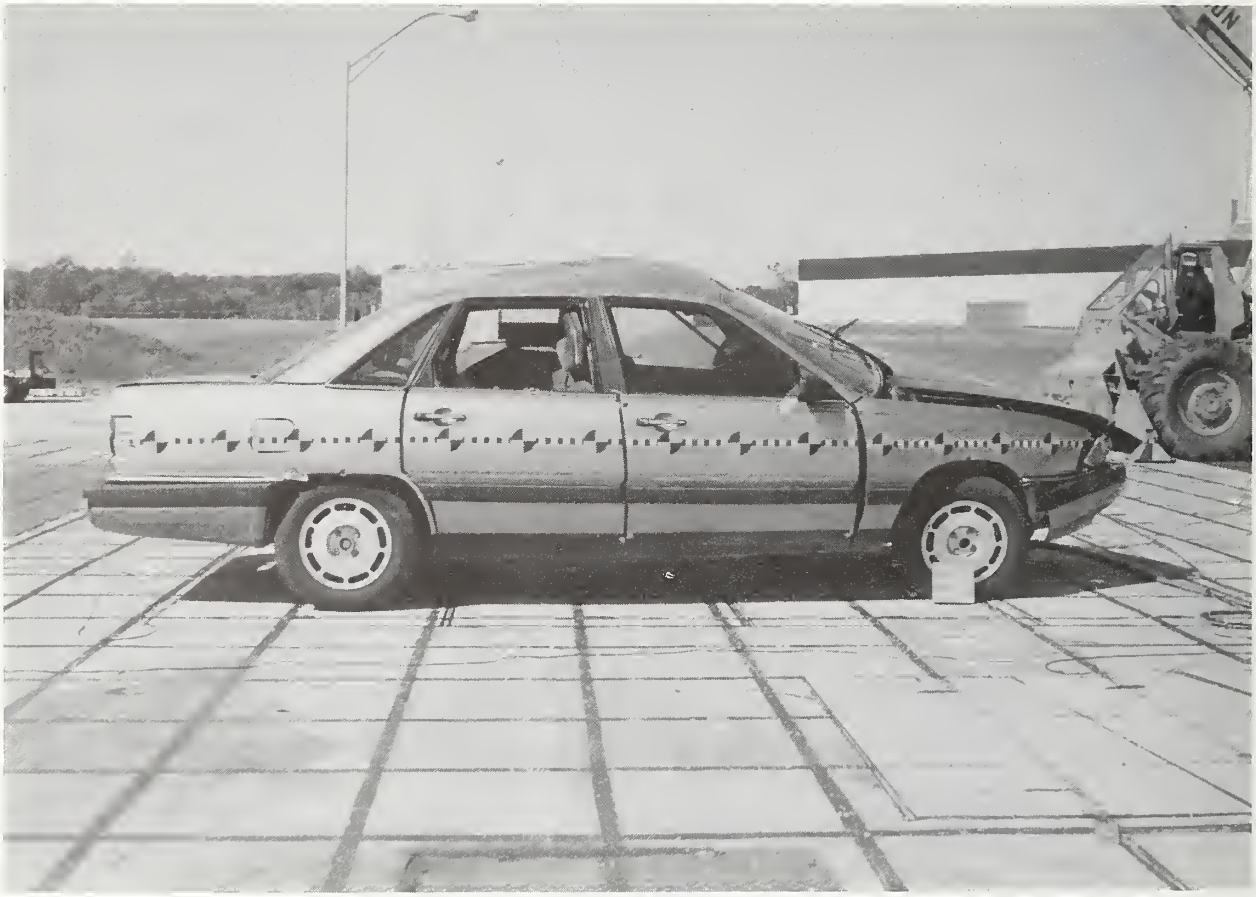


Figure A-39. POST-TEST OVERALL RIGHT SIDE VIEW

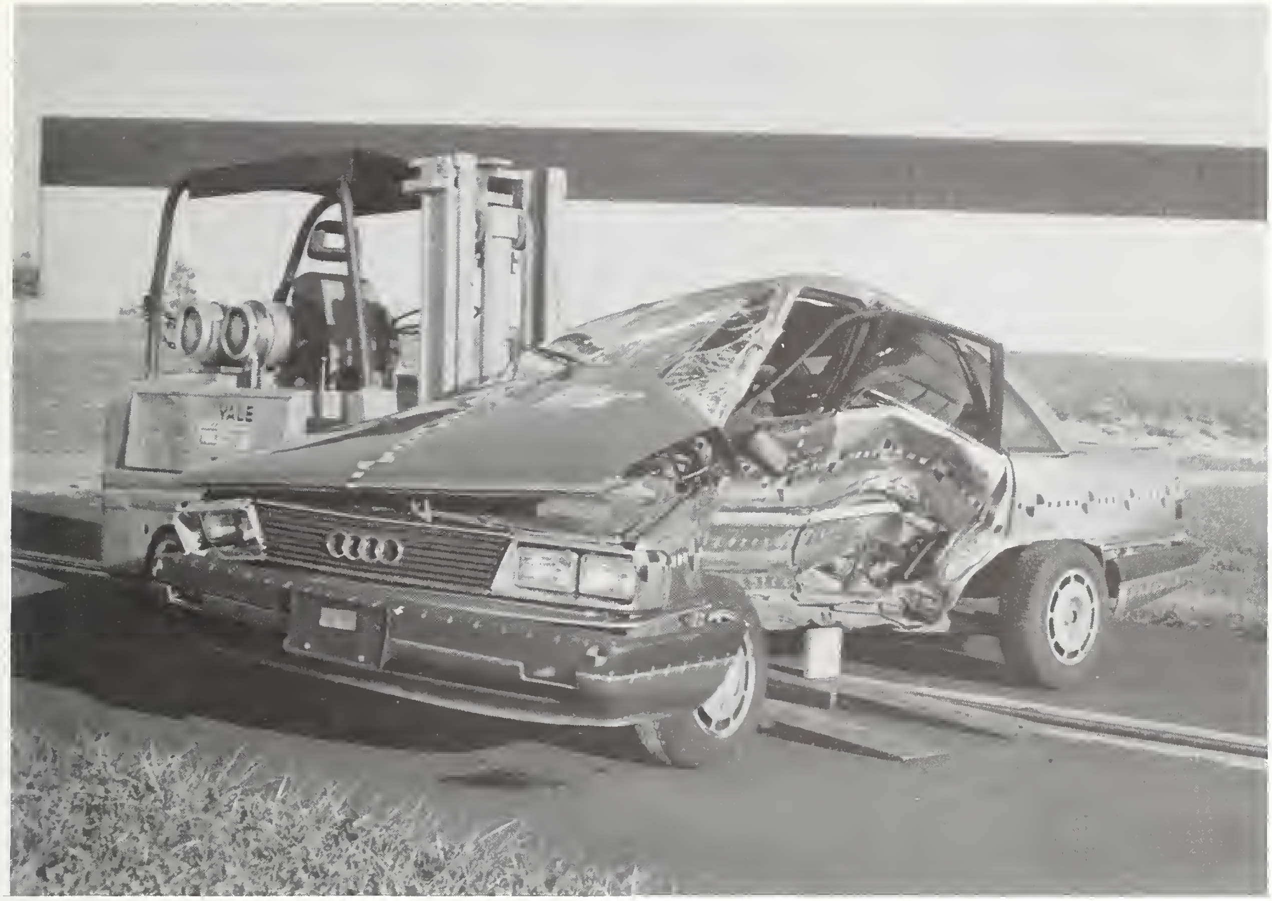


Figure A-40. POST-TEST LEFT FRONT THREE-QUARTER VIEW

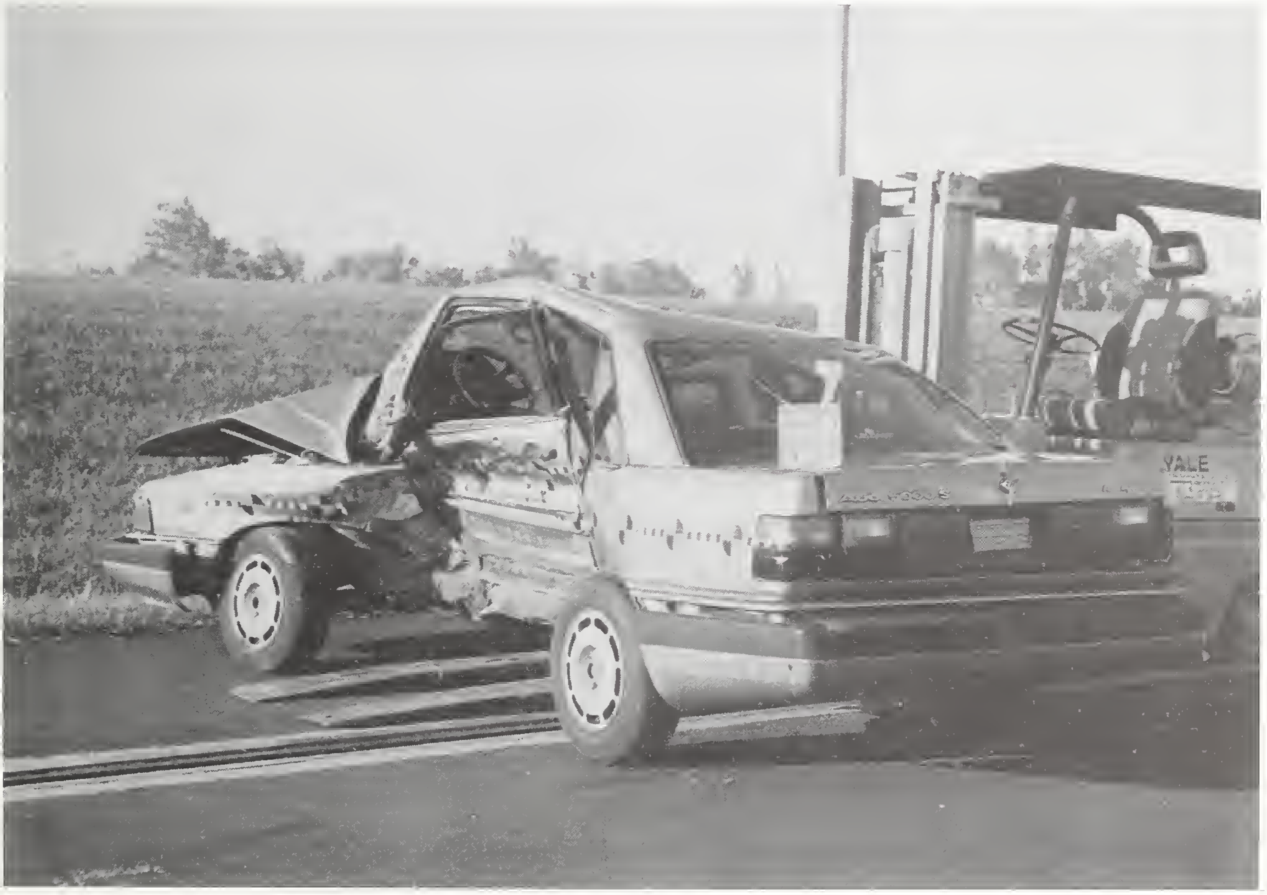


Figure A-41. POST-TEST LEFT REAR THREE-QUARTER VIEW

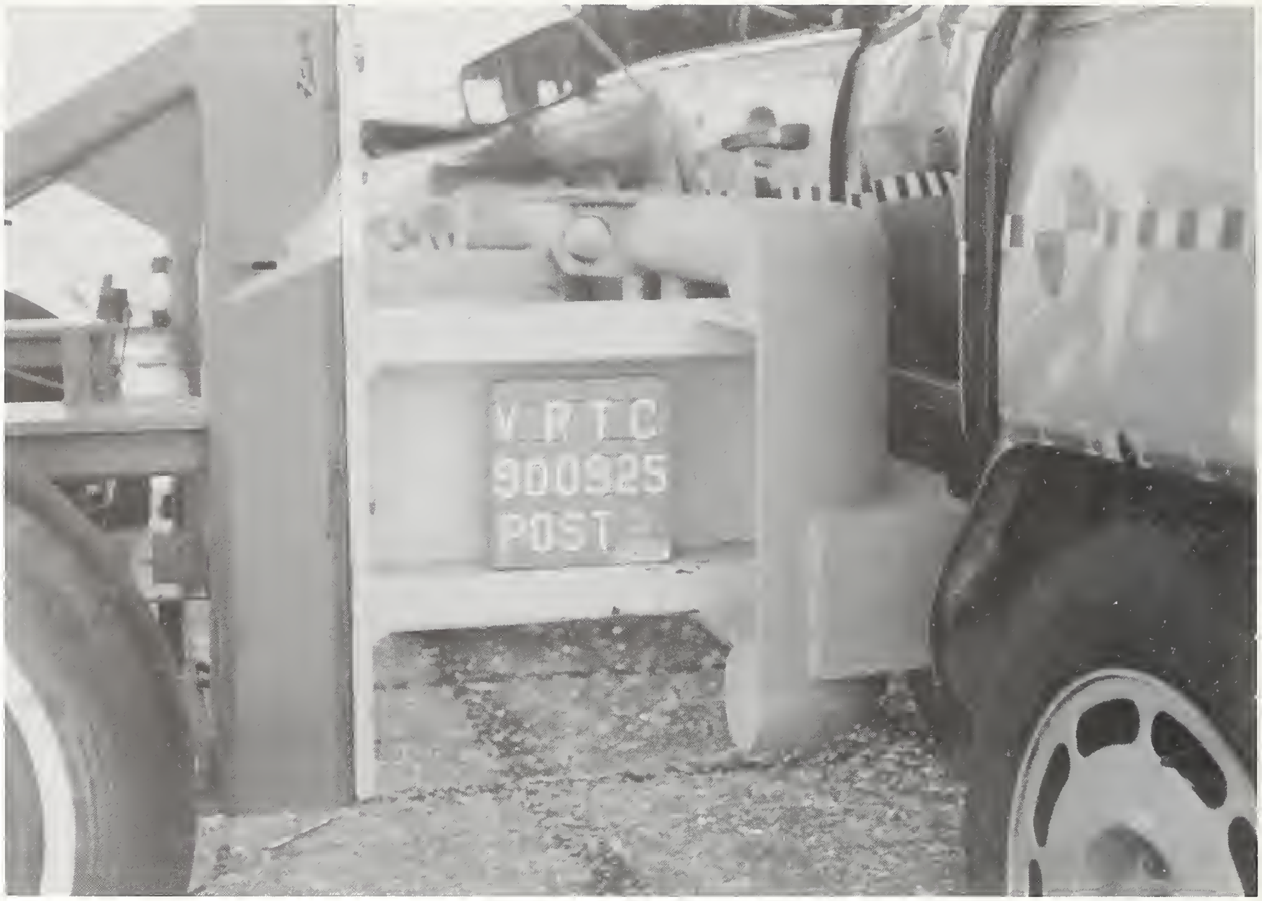


Figure A-42. POST-TEST CLOSE-UP LEFT REAR VIEW

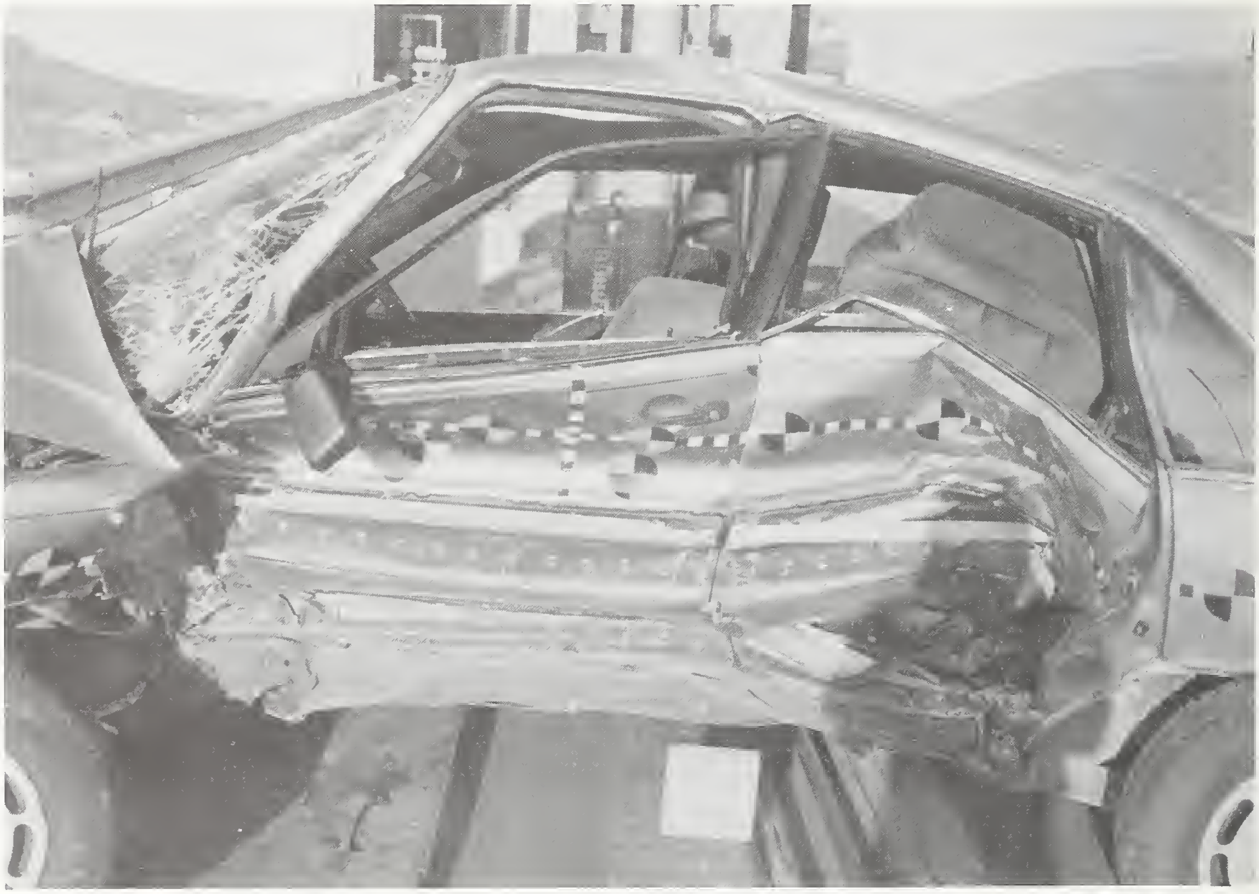


Figure A-43. POST-TEST LEFT SIDE CLOSE-UP VIEW

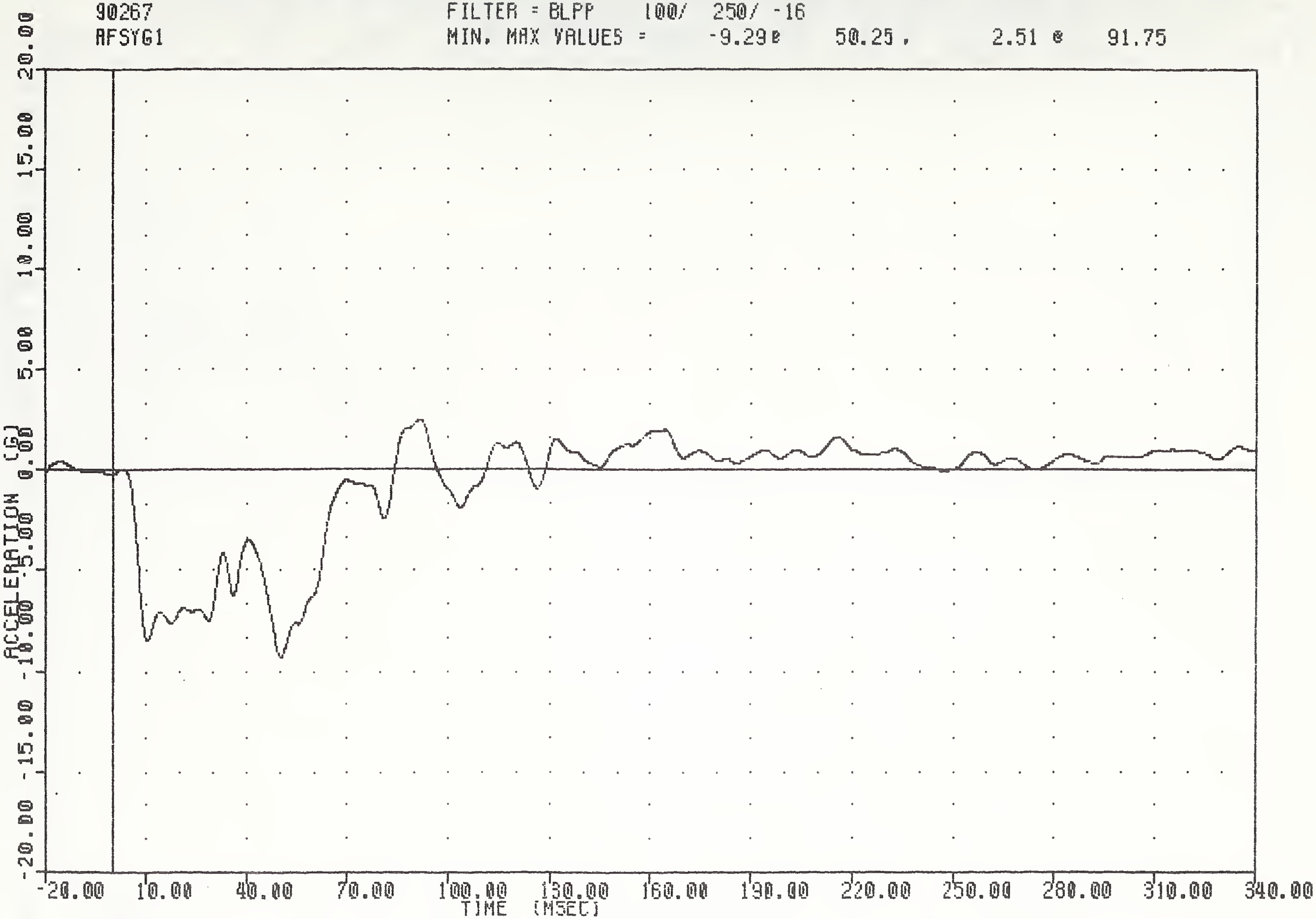
APPENDIX B

DATA PLOTS

TEST #900924-1

900924-1 . TRC
CRASH III DAMAGE ALGORITHM
90267
AFSYG1

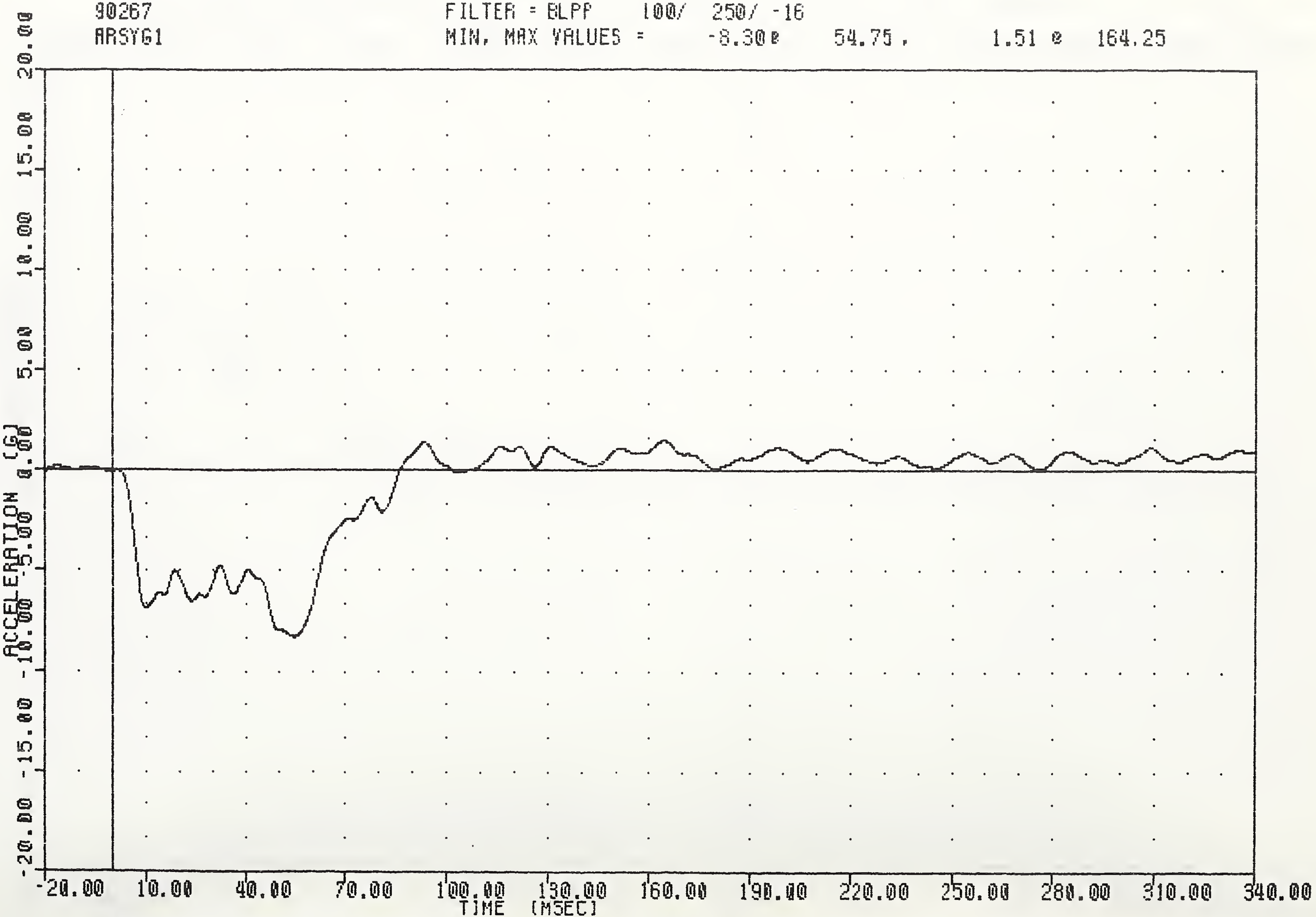
FILTER = BLPF 100/ 250/ -16
MIN. MAX VALUES = -9.29 @ 50.25 , 2.51 @ 91.75



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
RIGHT FRONT SILL Y-AXIS ACCELERATION

900924-1 , TRC
CRASH III DAMAGE ALGORITHM
90267
ARSYG1

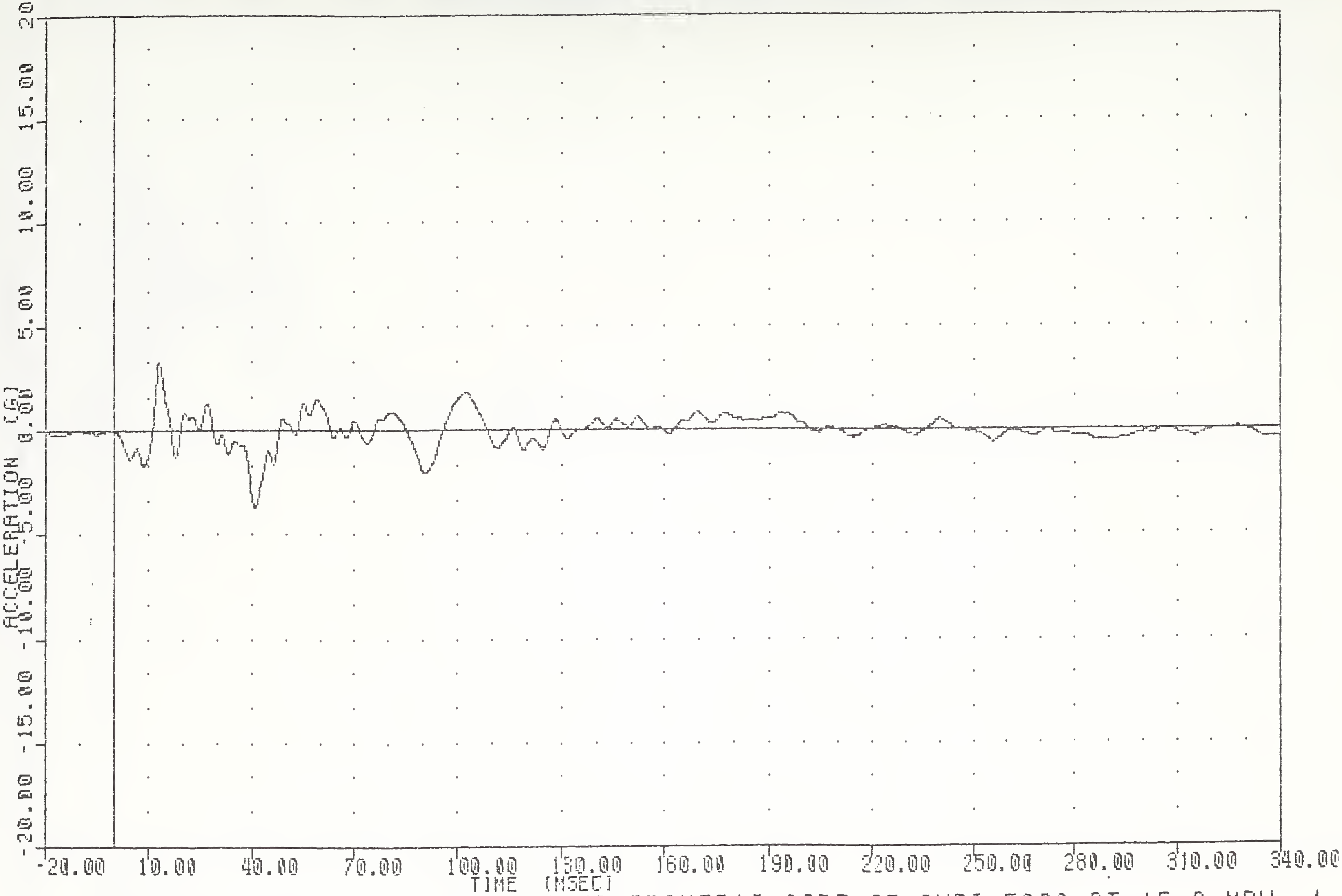
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -8.30 @ 54.75 , 1.51 @ 164.25



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
RIGHT REAR SILL Y-AXIS ACCELERATION

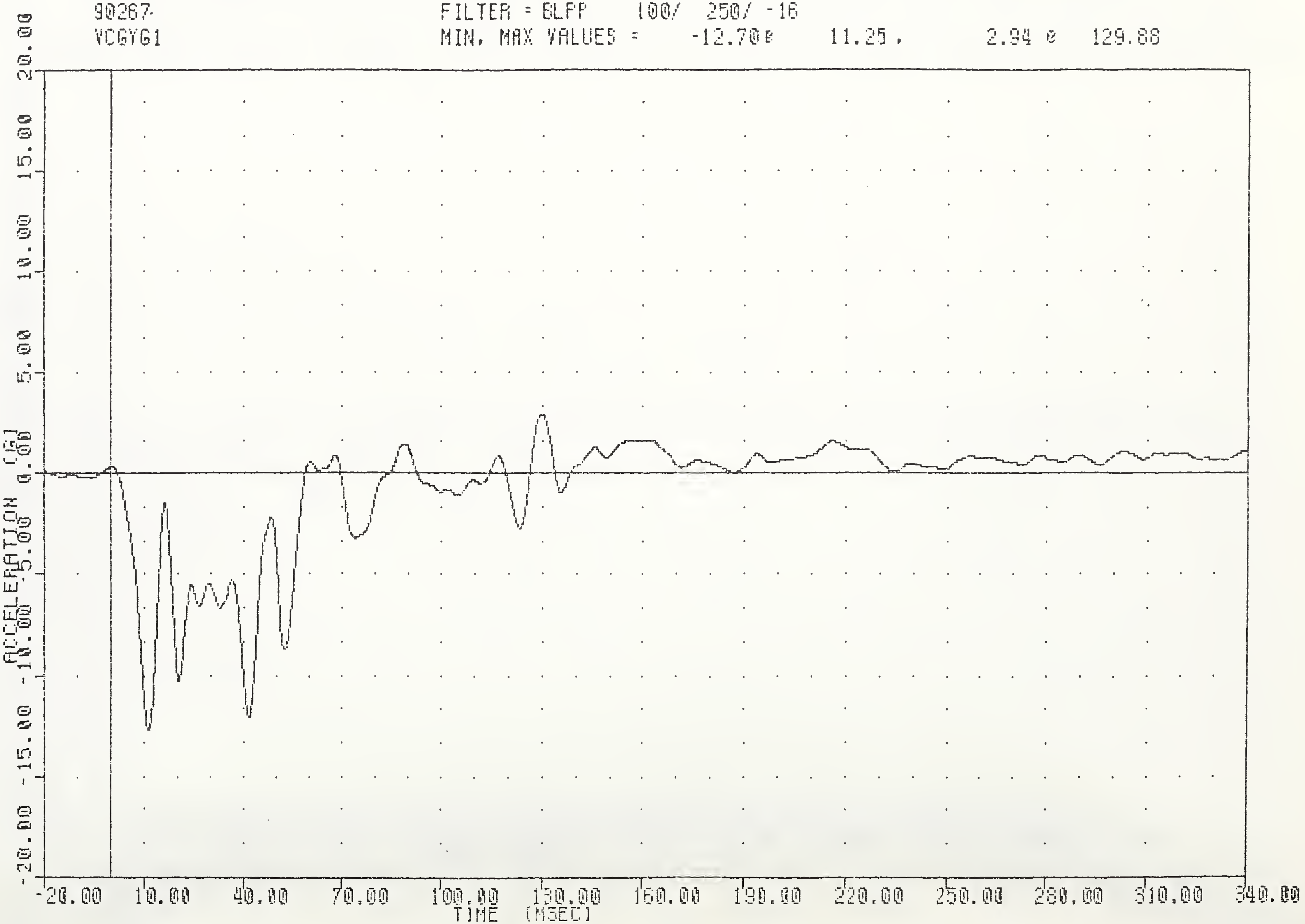
900924-1 , TRC
CRASH III DAMAGE ALGORITHM
90267
YCGXG1

FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -3.64 @ 41.00 , 3.28 @ 13.13



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
VEHICLE CG X-AXIS ACCELERATION (PERPENDICULAR TO IMPACT DIRECTION)

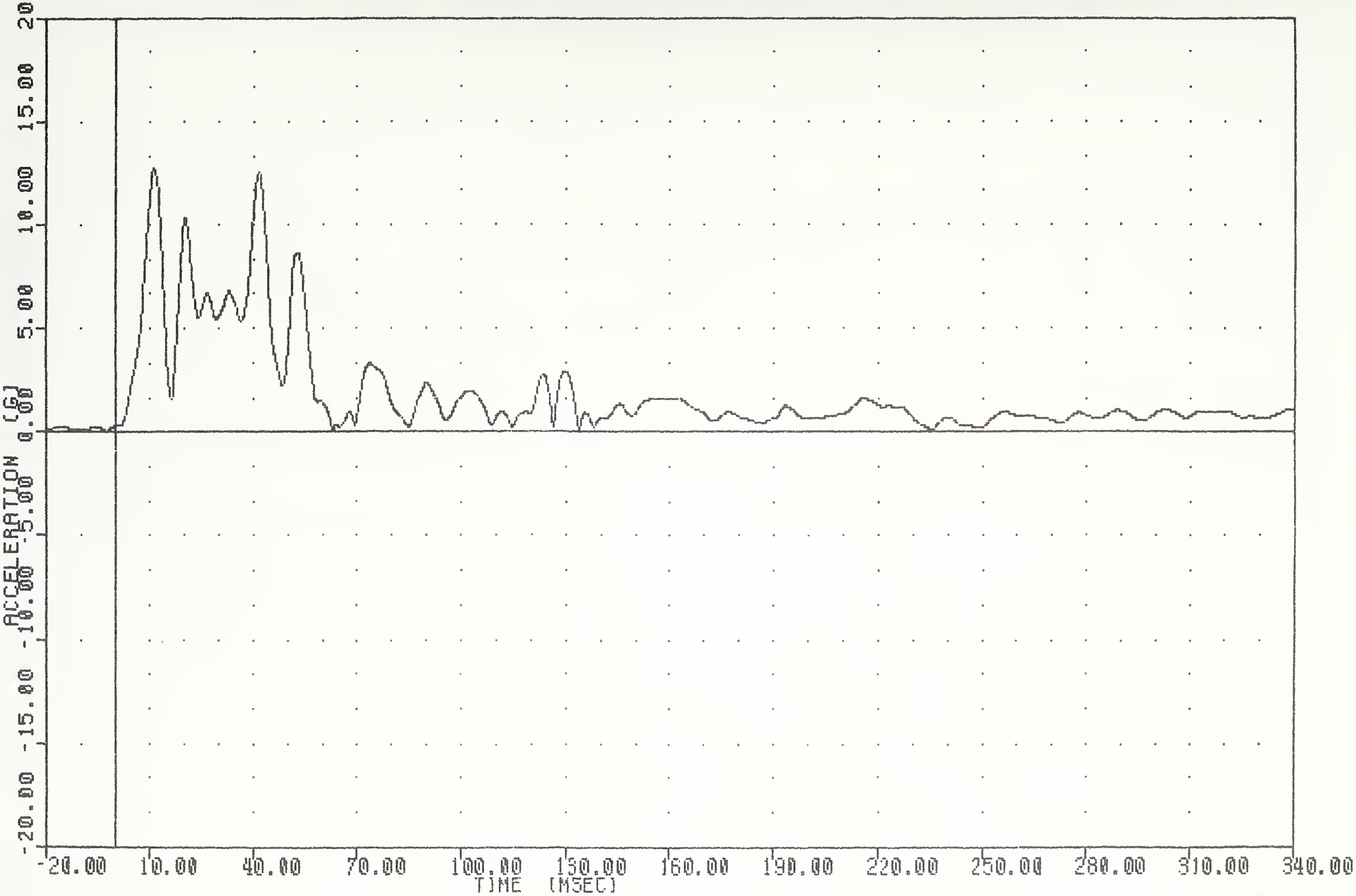
900924-1 , TRC
CRASH III DAMAGE ALGORITHM
90267 FILTER = BLPF 100/ 250/ -16
VCGYG1 MIN, MAX VALUES = -12.70 @ 11.25 , 2.94 @ 129.88



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
VEHICLE CG Y-AXIS ACCELERATION [IMPACT DIRECTION]

900924-1 , TRC
CRASH III DAMAGE ALGORITHM
90267
VCGRG1

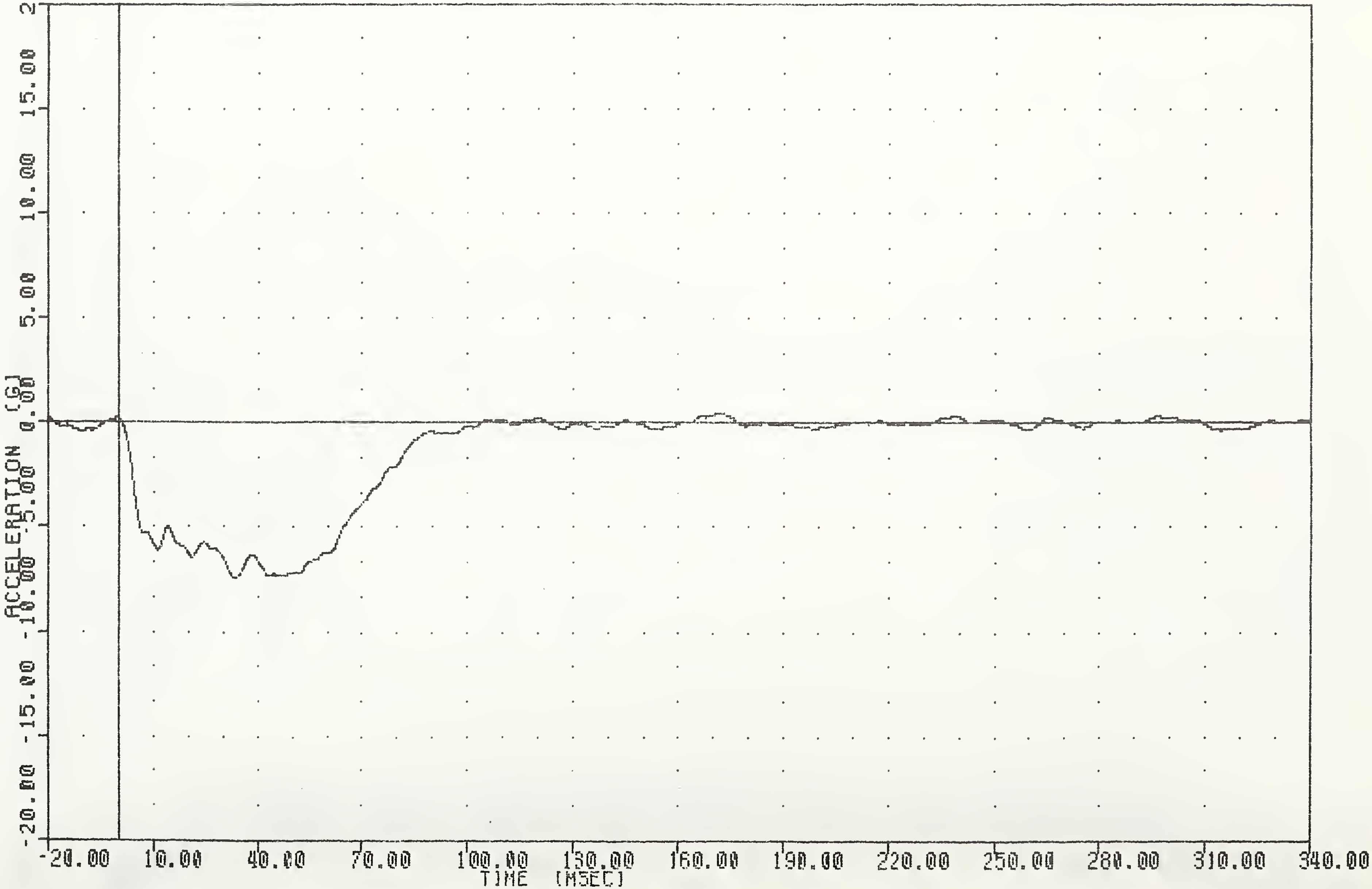
FILTER = BLPF 100/ 250/ -16
MIN. MAX VALUES = 0.05 @ -2.75 , 12.70 @ 11.25



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
VEHICLE CG RESULTANT ACCELERATION

900924-1 .TRC
CRASH III DAMAGE ALGORITHN
90267
BCGXG

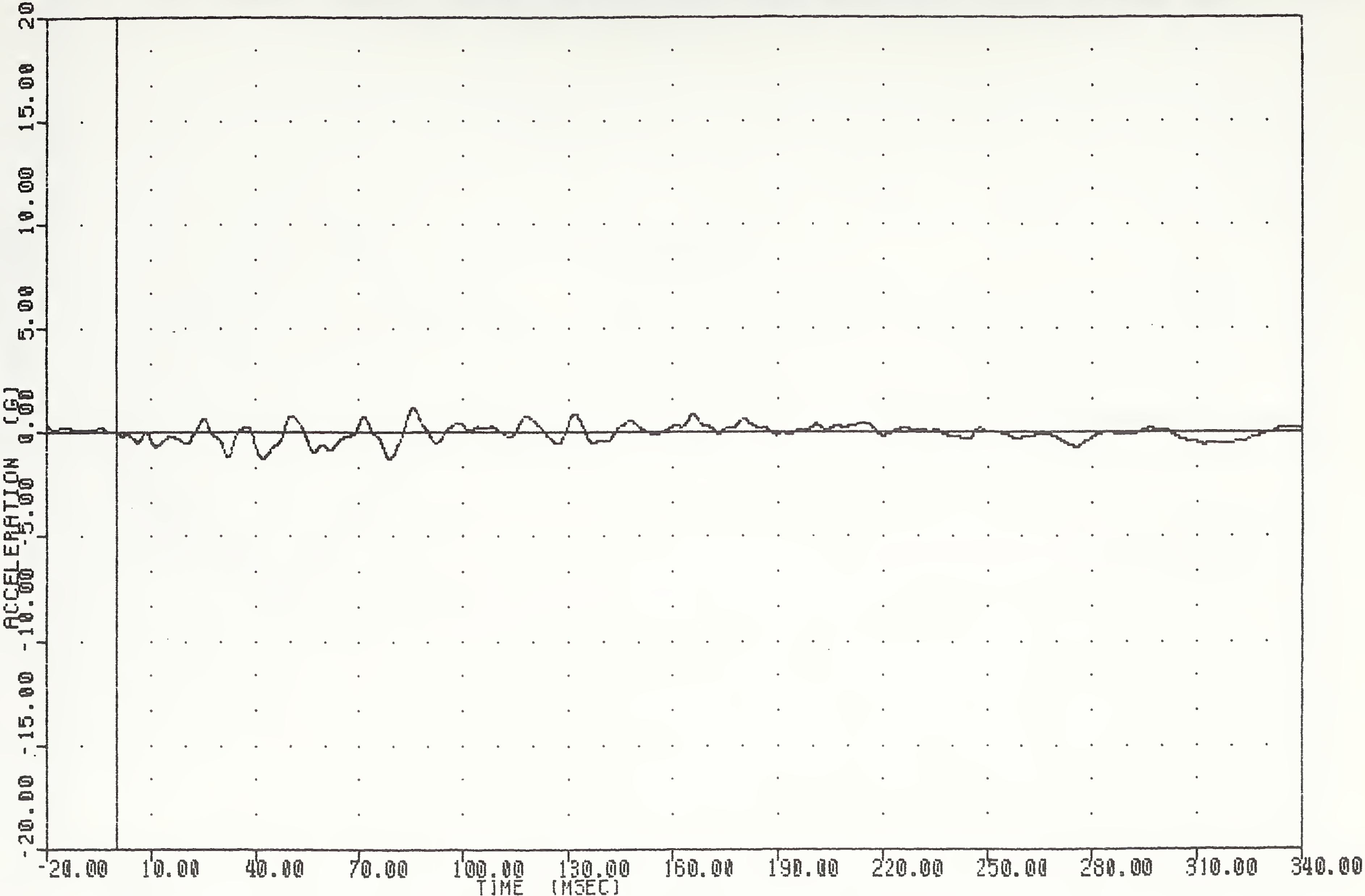
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -7.42 @ 33.25 , 0.48 @ 171.63



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
MOVING BARRIER CENTER OF GRAVITY X-AXIS ACCELERATION

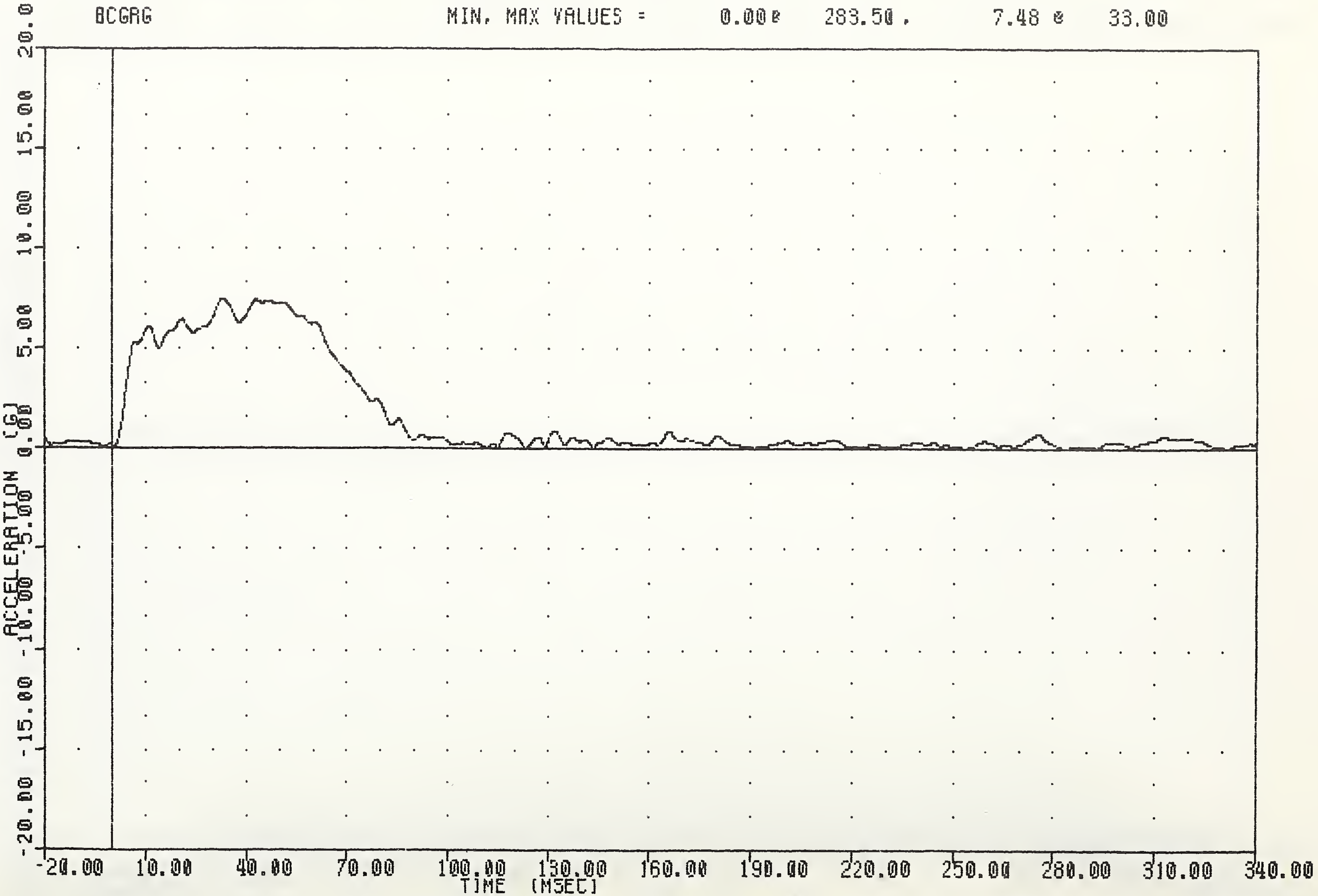
900924-1 , TRC
CRASH III DAMAGE ALGORITHN
90267
BCGYG

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -1.26 @ 78.88 , 1.24 @ 85.50



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
MOVING BARRIER CENTER OF GRAVITY Y-AXIS ACCELERATION

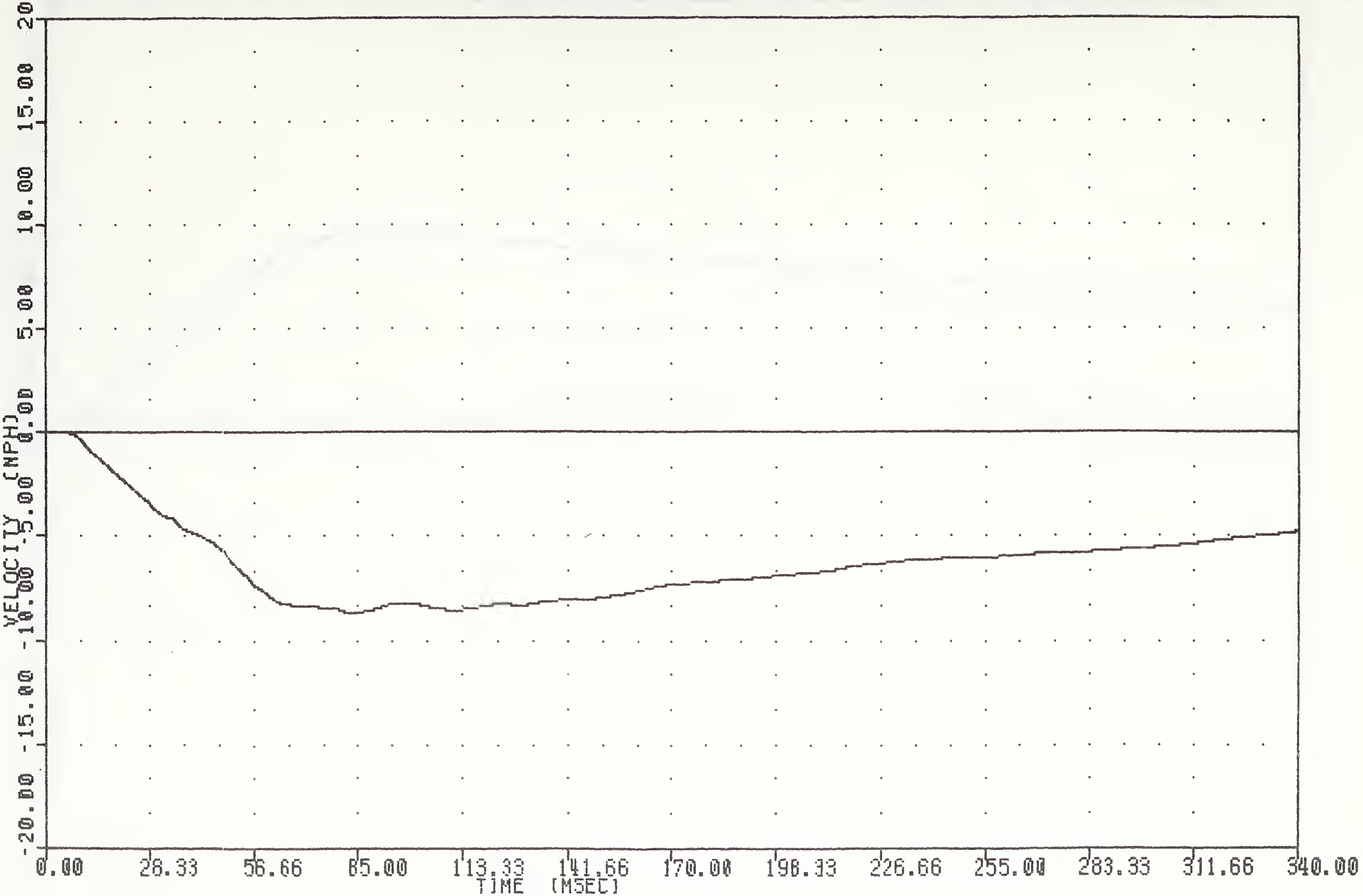
```
900924-1     , TRC
CRASH III DAMAGE ALGORITHM
90267                          FILTER = BLPF    100/  250/ -16
BCGRG                          MIN, MAX VALUES =      0.00@   283.50 ,       7.48 @    33.00
```



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
MOVING BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION

900924-1 , TRC
CRASH III DAMAGE ALGORITHM
90267
AFSYV1

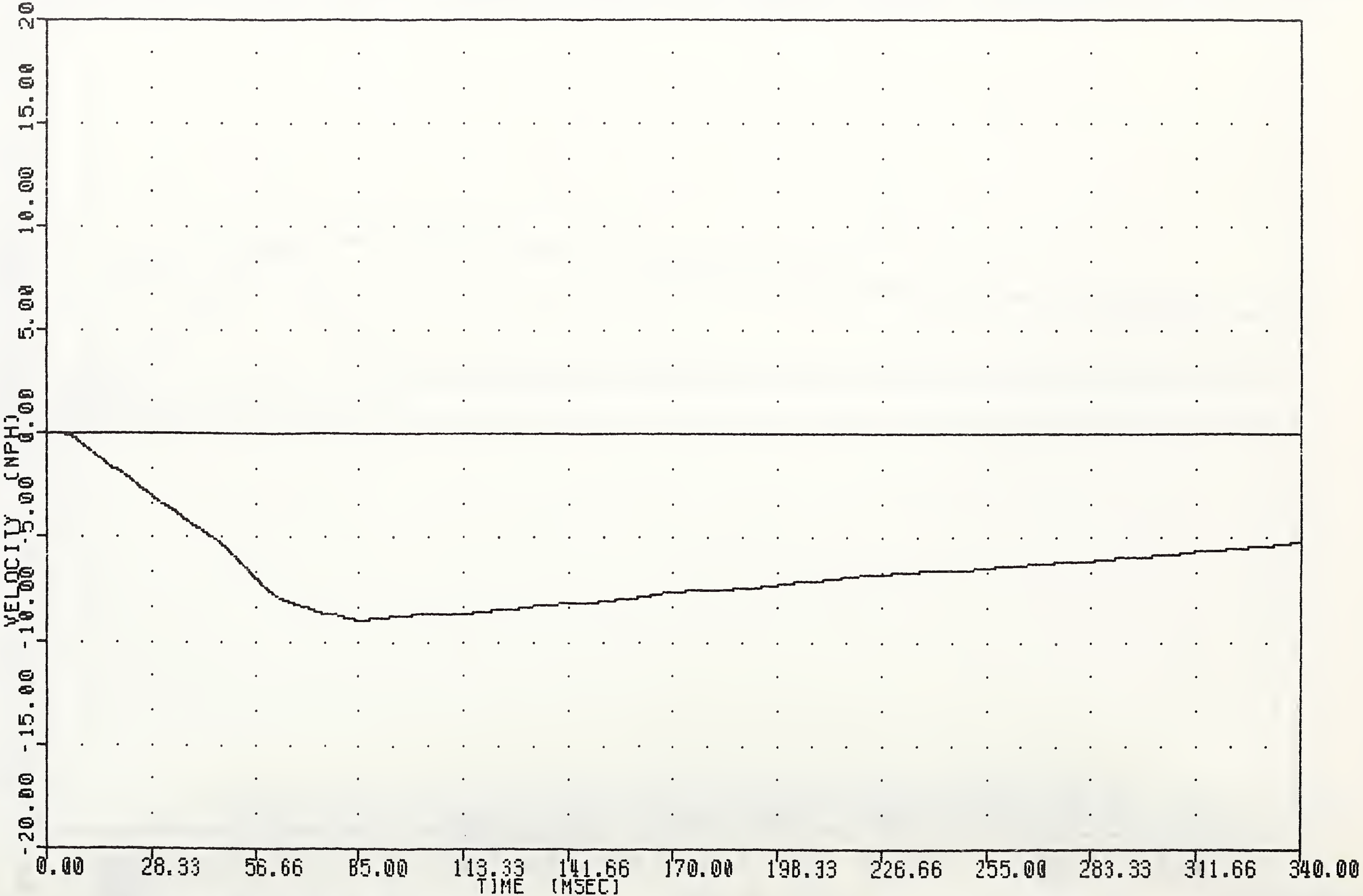
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -8.71 @ 83.38 , 0.00 @ 0.00



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
RIGHT FRONT SILL Y-AXIS VELOCITY

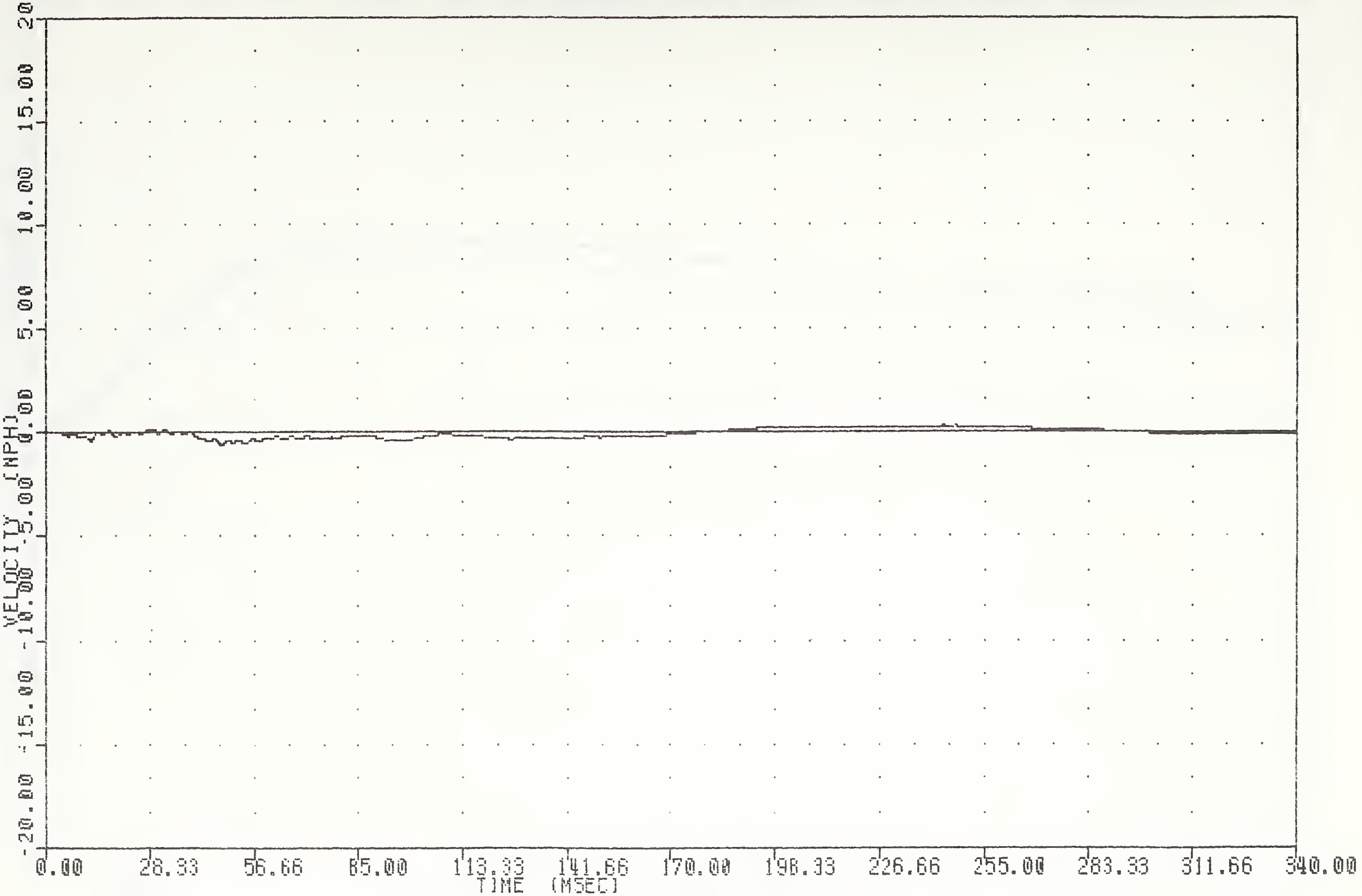
900924-1 , TRC
CRASH III DAMAGE ALGORITHM
90267
ARSYV1

FILTER = BLPF 300/ 750/ -16
MIN. MAX VALUES = -8.95 @ 86.75 , 0.00 @ 0.00

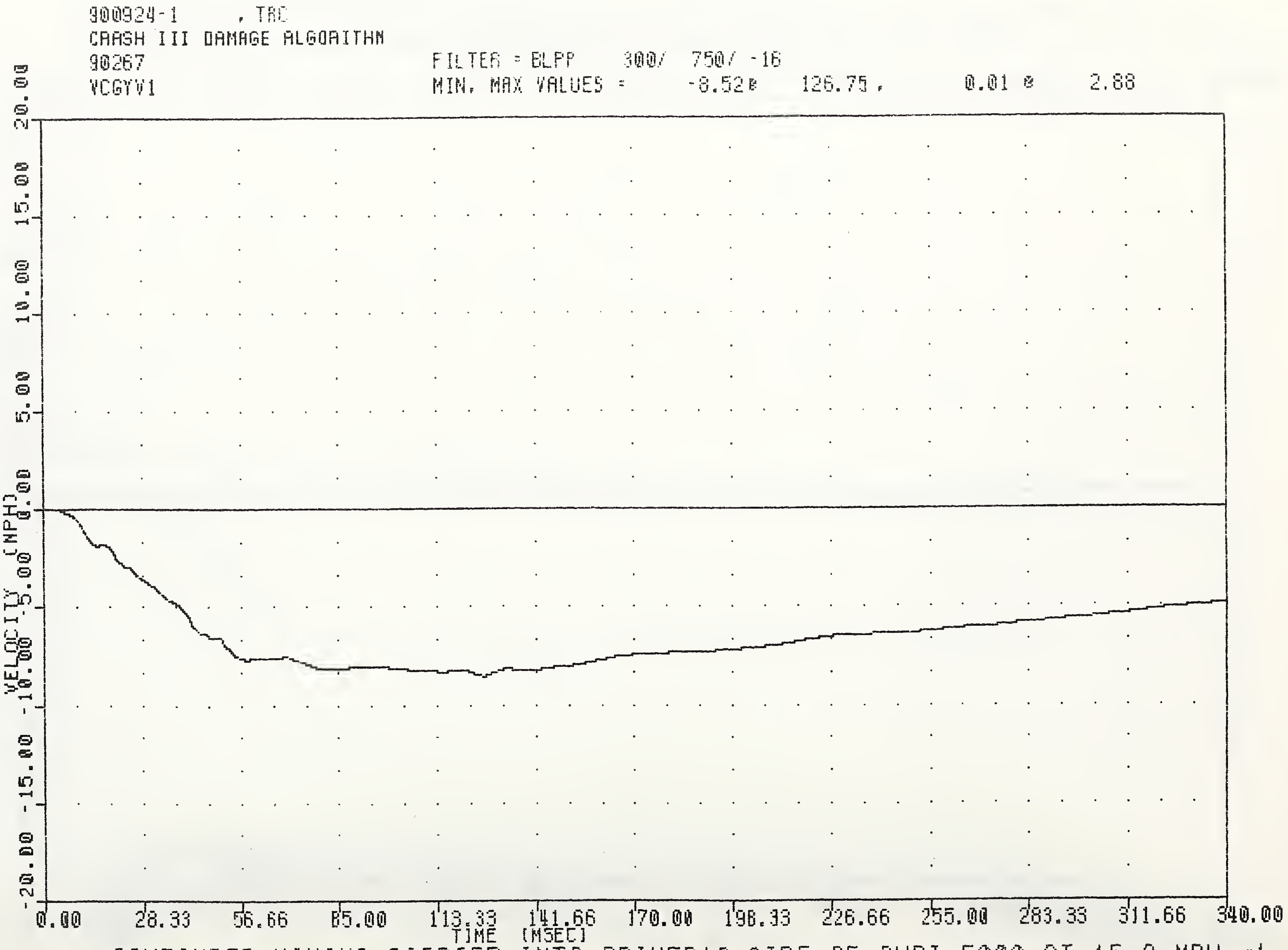


CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
RIGHT REAR SILL Y-AXIS VELOCITY

900924-1 , TRC
CRASH III DAMAGE ALGORITHM
90267 FILTER = BLPF 300/ 750/ -16
VCGXV1 MIN, MAX VALUES = -0.59 @ 47.63 , 0.29 @ 247.25



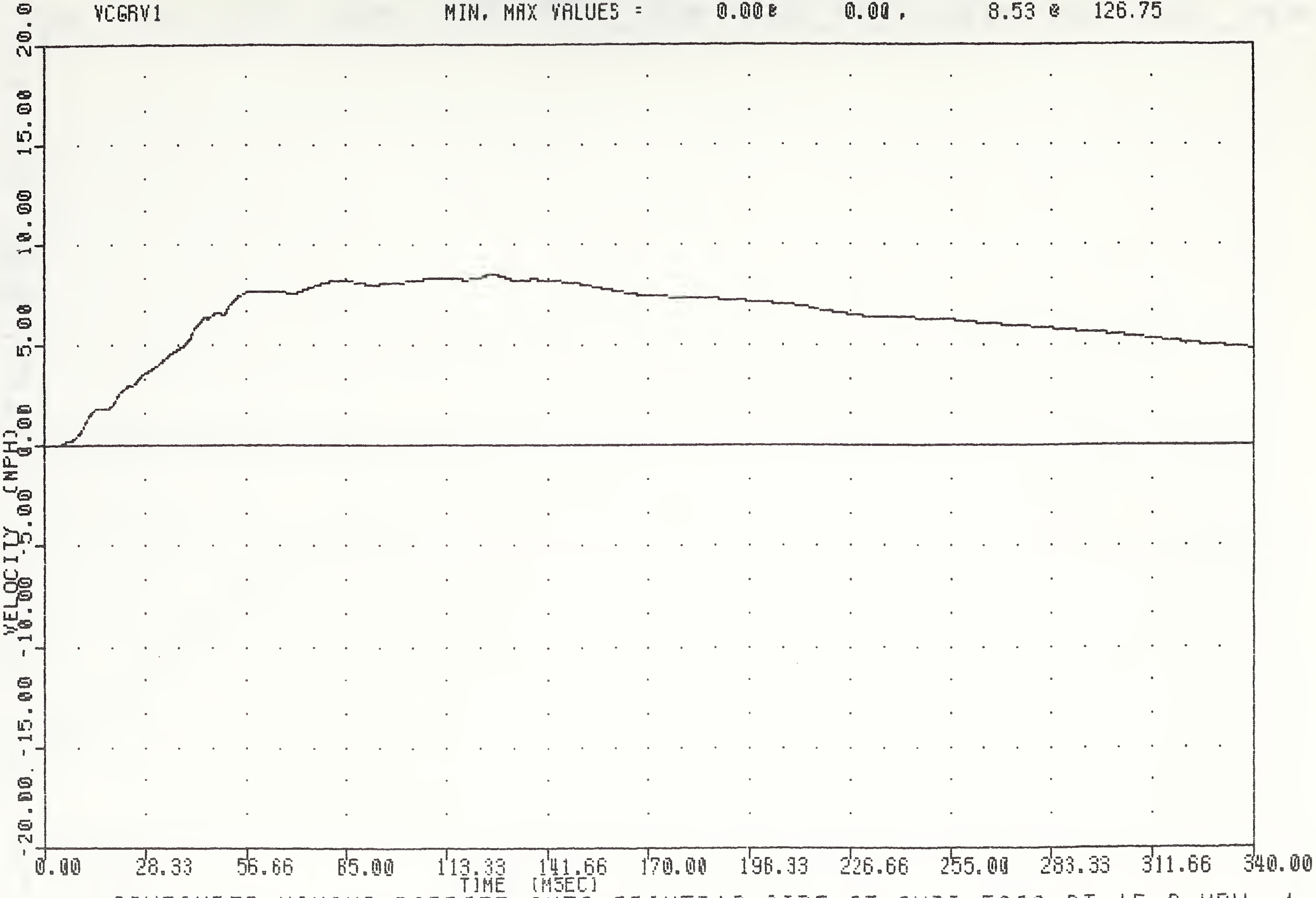
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
VEHICLE CG X-AXIS VELOCITY (PERPENDICULAR TO IMPACT DIRECTION)



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
VEHICLE CG Y-AXIS VELOCITY (IMPACT DIRECTION)

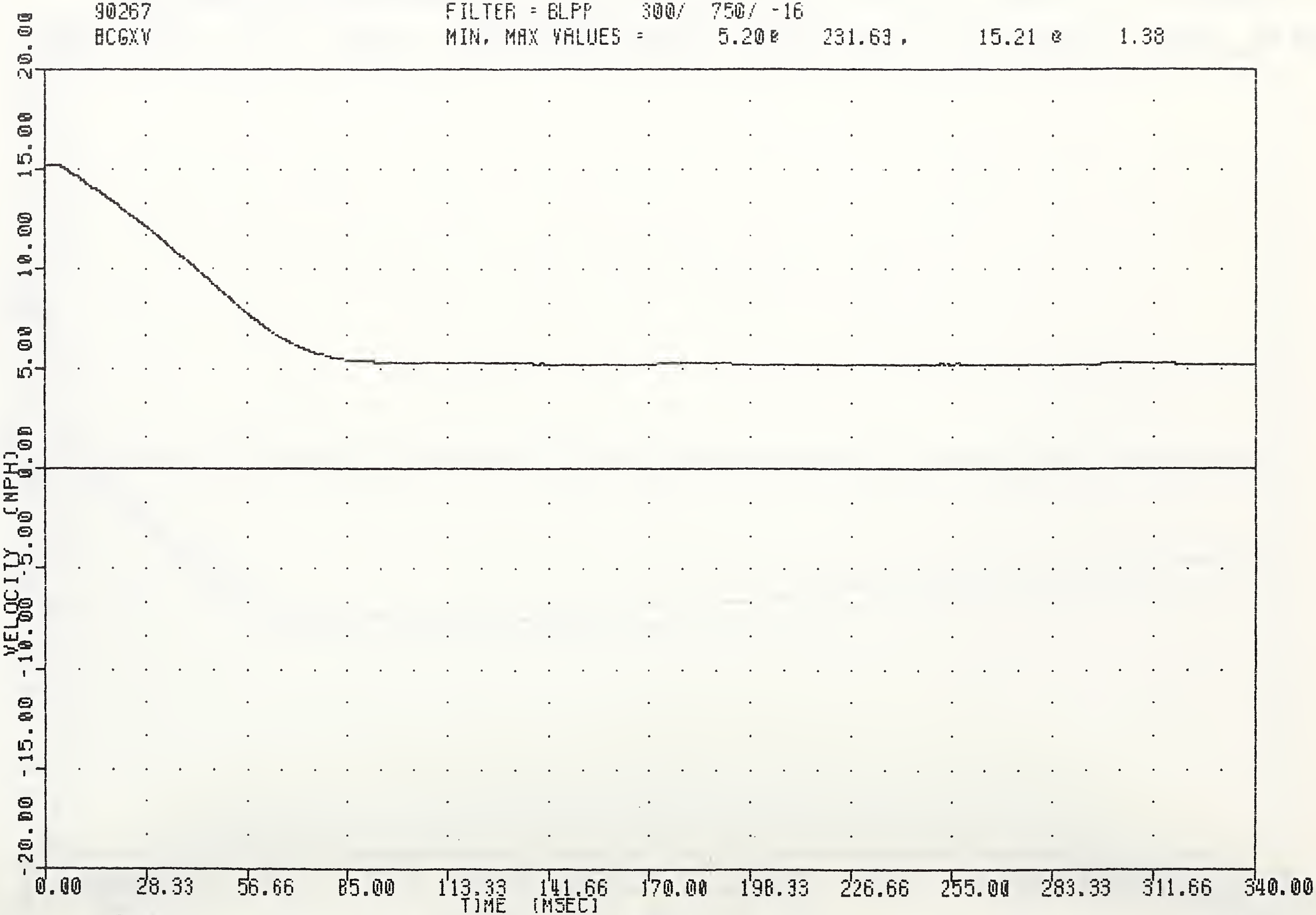
900924-1 . TRC
CRASH III DAMAGE ALGORITHM
90267
VCGRV1

FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = 0.00 @ 0.00 , 8.53 @ 126.75



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
VEHICLE CG RESULTANT VELOCITY

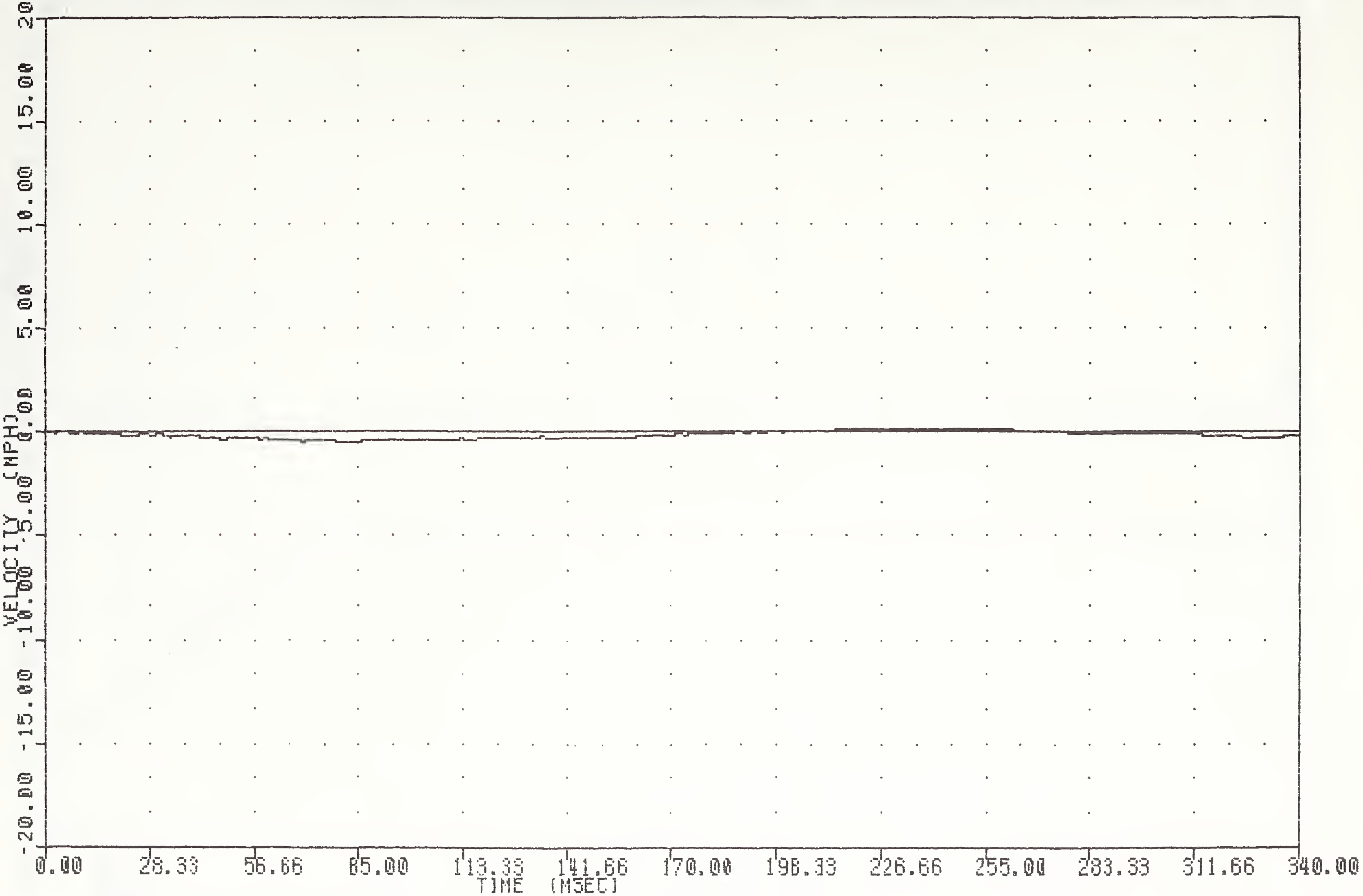
900924-1 , TRC
CRASH III DAMAGE ALGORITHM
90267 FILTER = BLPP 300/ 750/ -16
BCGXV MIN, MAX VALUES = 5.20 @ 231.63 , 15.21 @ 1.38



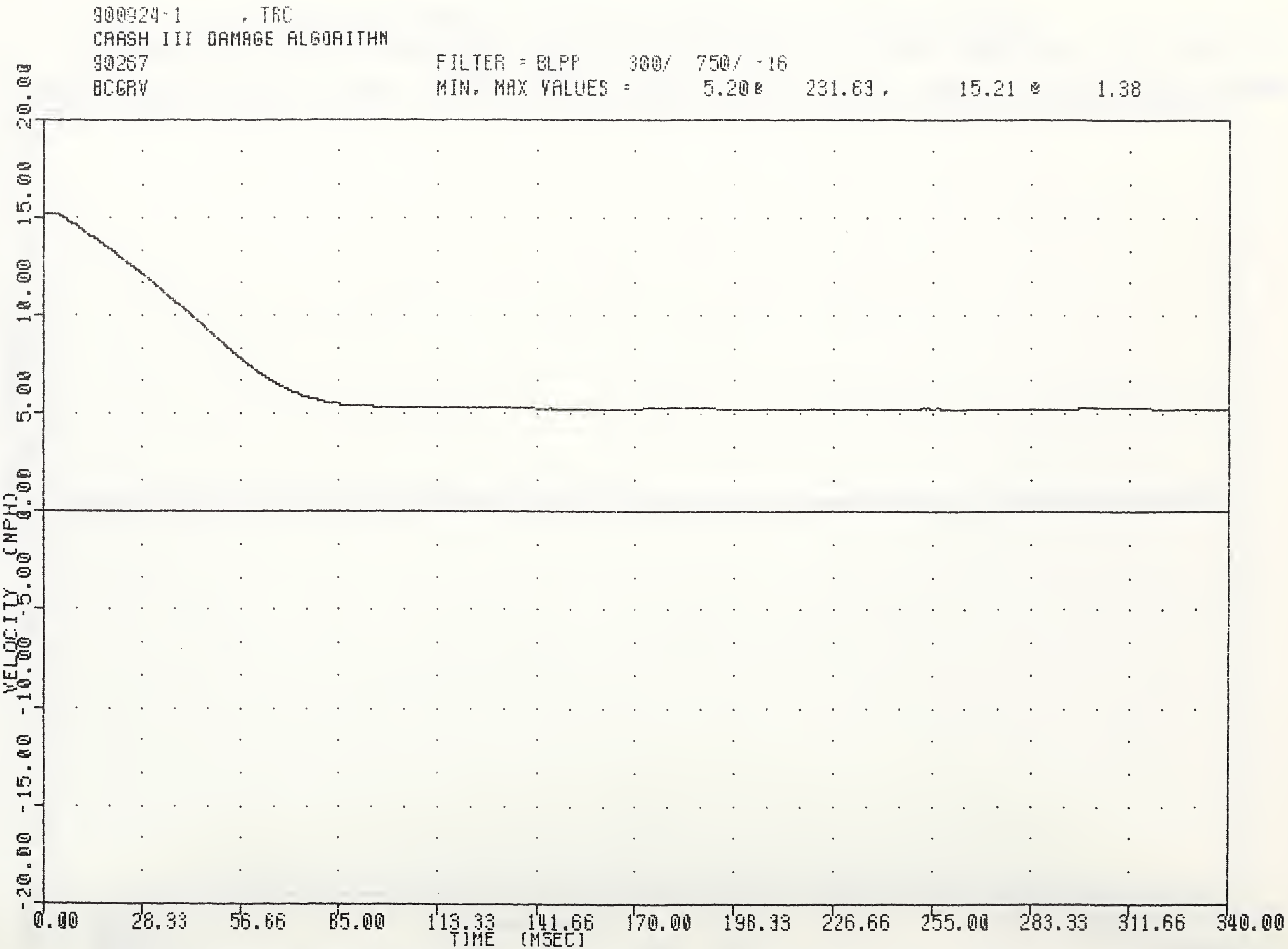
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
MOVING BARRIER CENTER OF GRAVITY X-AXIS VELOCITY

900924-1 , TRC
CRASH III DAMAGE ALGORITHM
90267
BCGYV

FILTER = BLPF 300/ 750/ -16
MIN. MAX VALUES = -0.53 @ 83.88 , 0.15 @ 236.50



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
MOVING BARRIER CENTER OF GRAVITY Y-AXIS VELOCITY

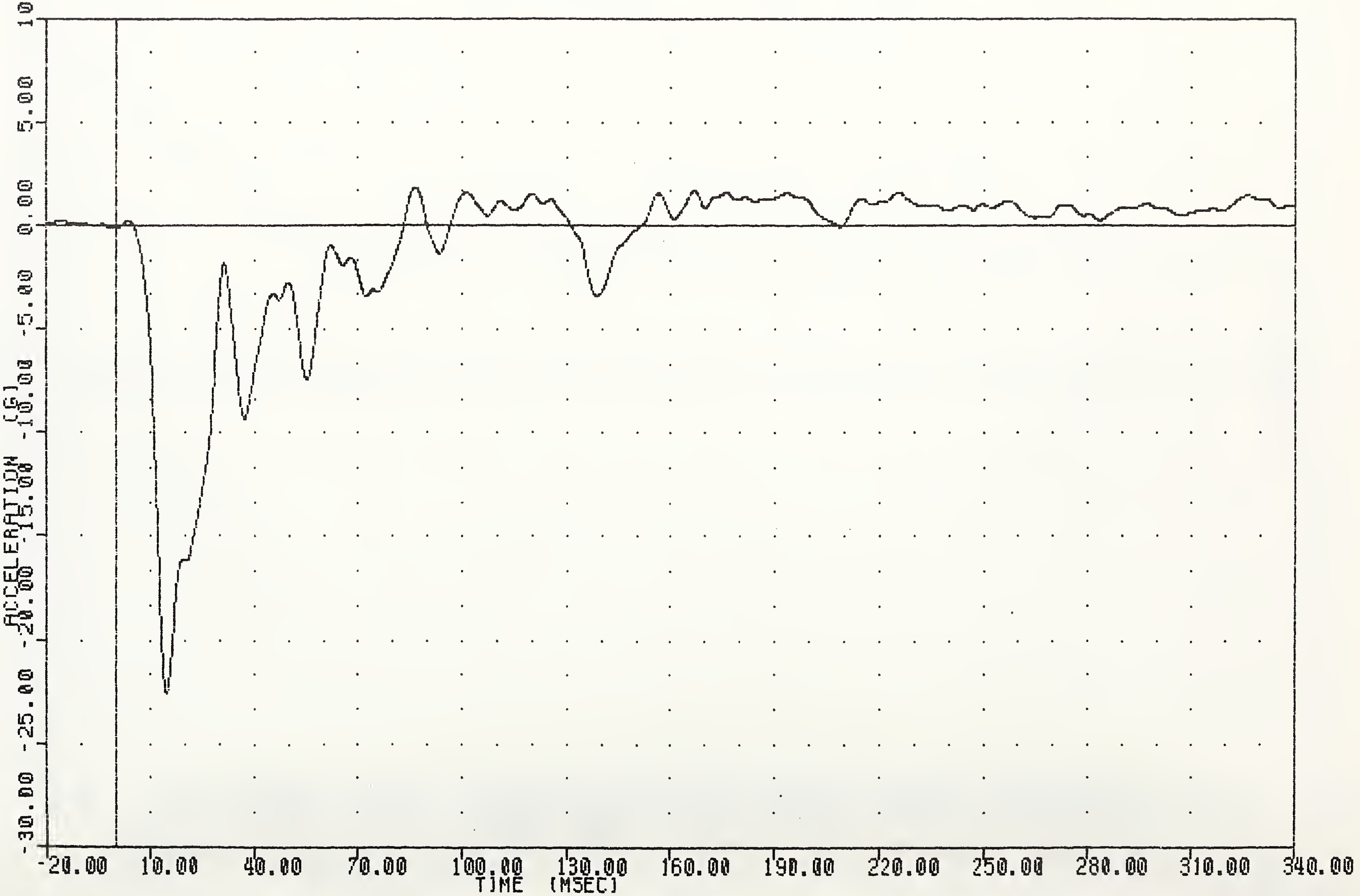


CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 15.2 MPH #1
MOVING BARRIER CENTER OF GRAVITY RESULTANT VELOCITY

TEST #900924-2

900924-2 , TRC
CRASH III DAMAGE ALGORITHN
90267
AFSYG1

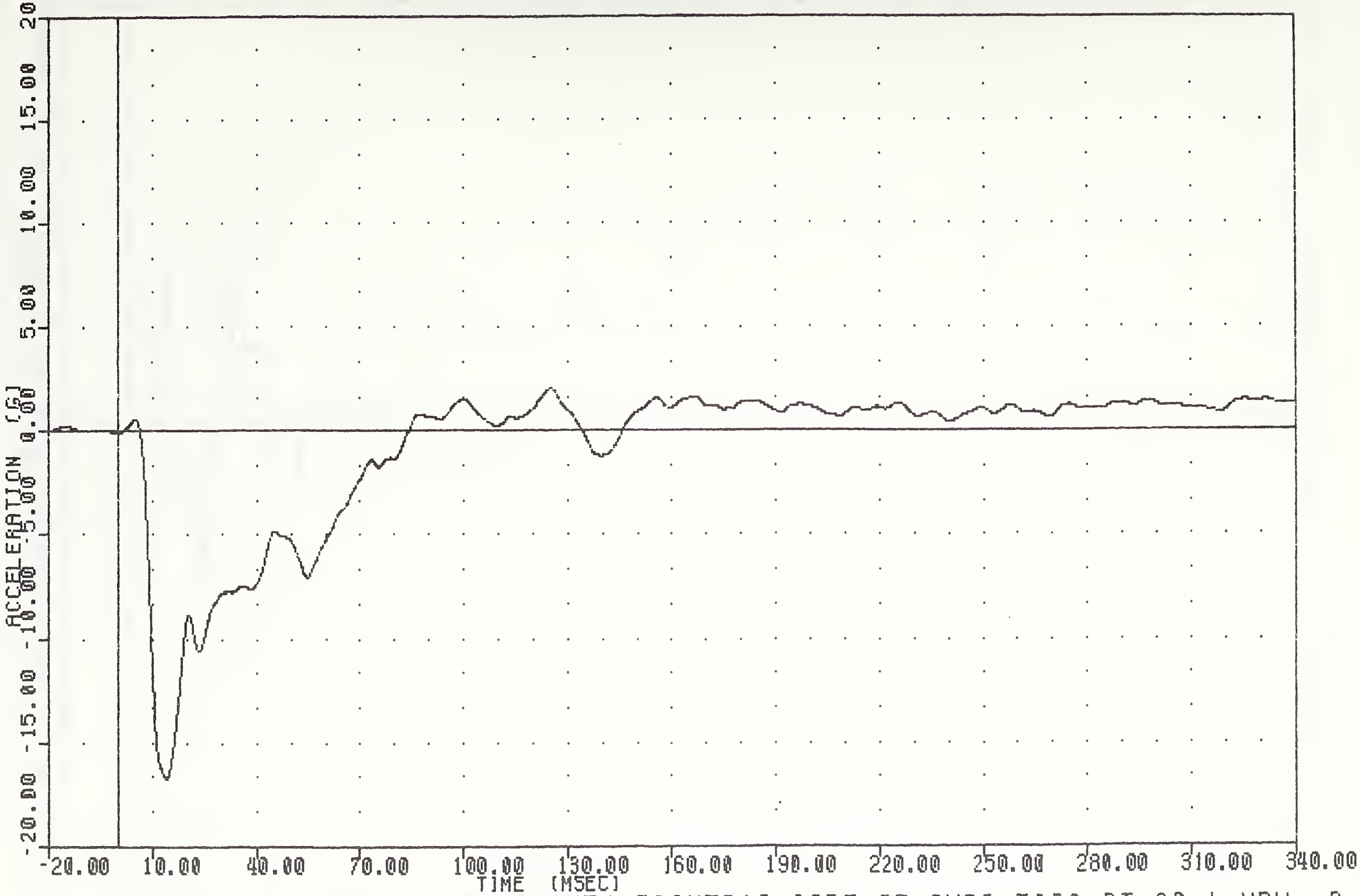
FILTER = BLPF 100/ 250/ -16
MIN. MAX VALUES = -22.61 @ 14.63 , 1.82 @ 86.50



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
RIGHT FRONT SILL Y-AXIS ACCELERATION

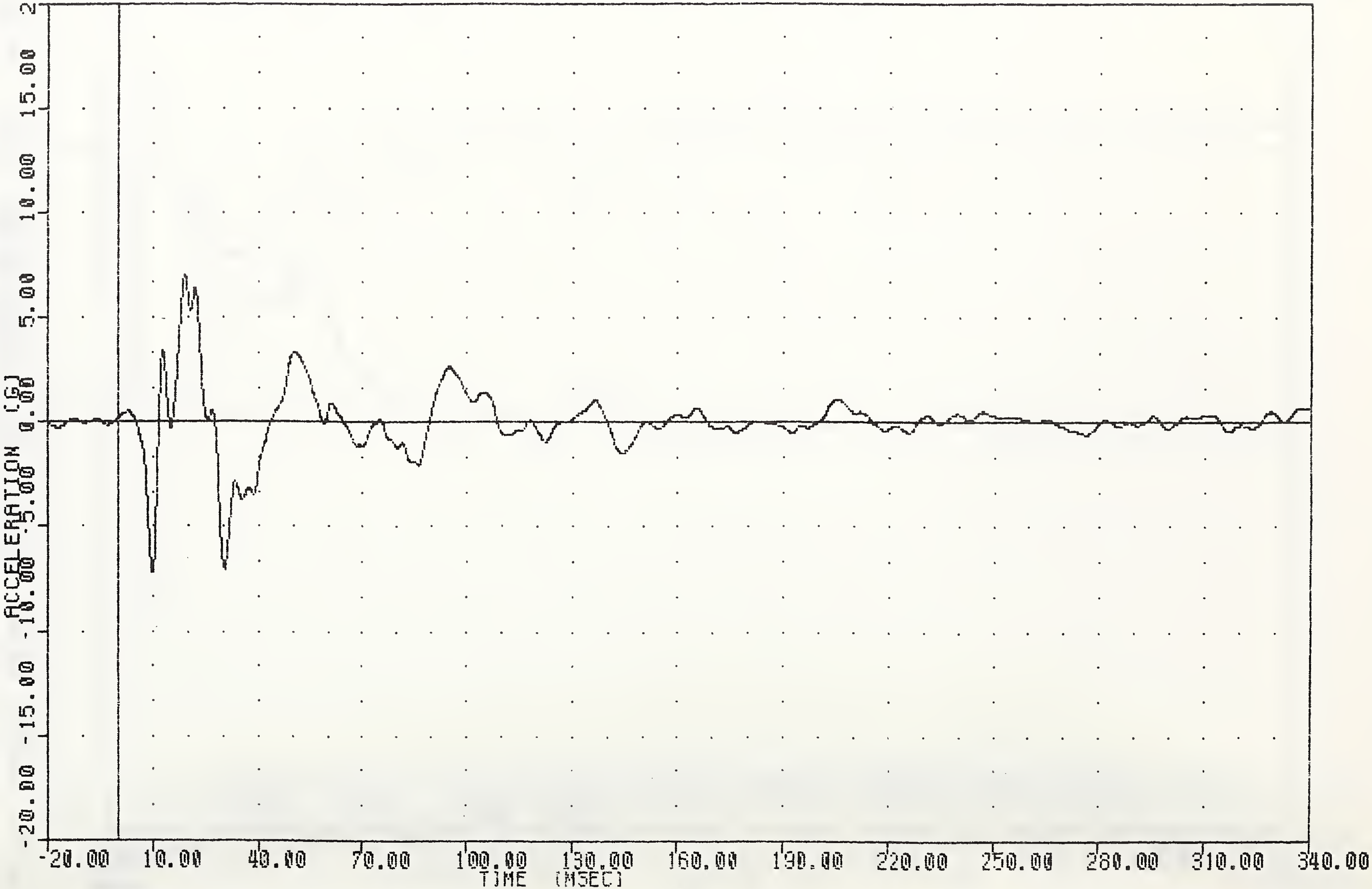
900924-2 , TRC
CRASH III DAMAGE ALGORITHN
90267
ARSYG1

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -16.72 @ 14.00 , 2.01 @ 125.00



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
RIGHT REAR SILL Y-AXIS ACCELERATION

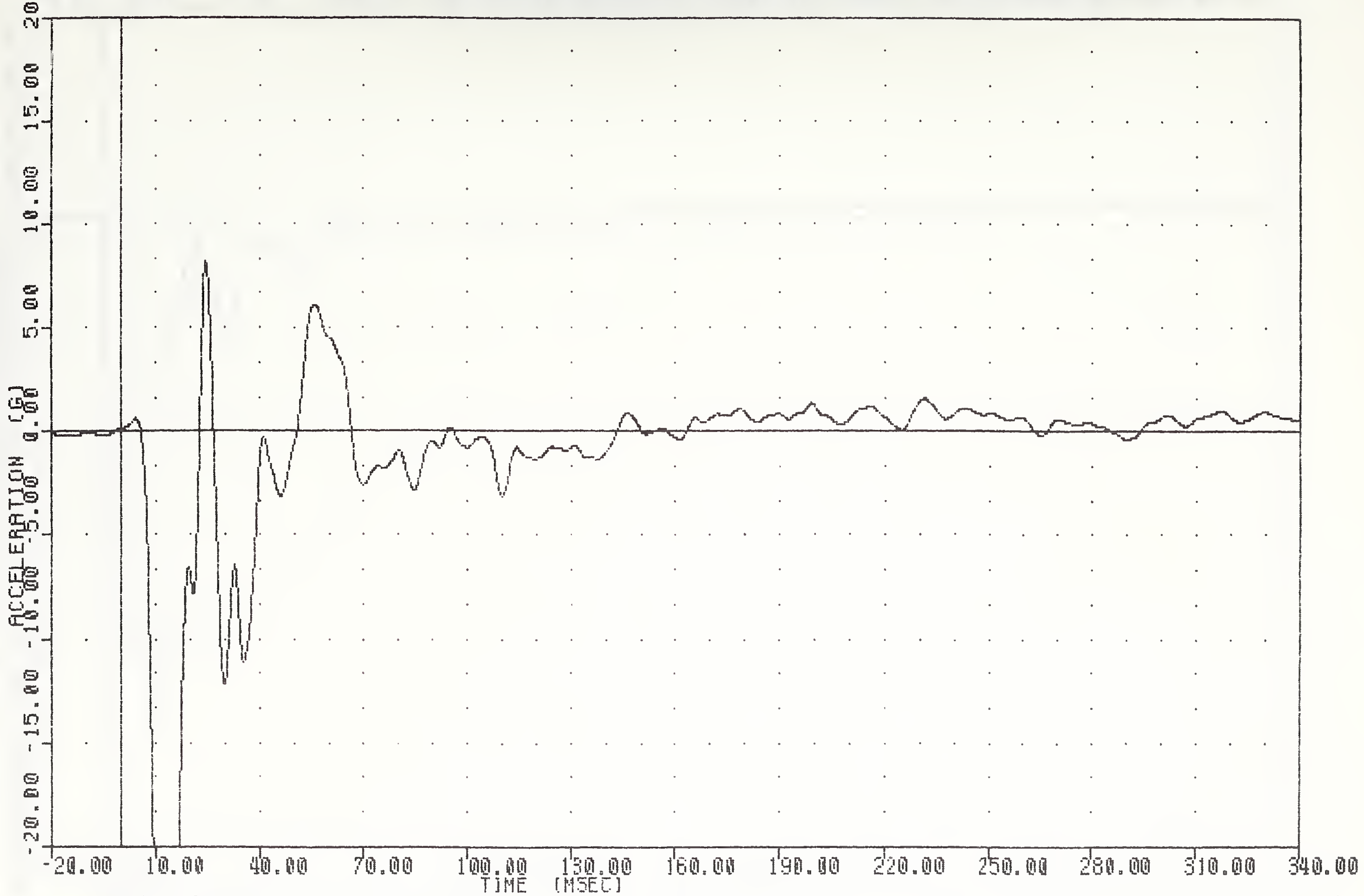
900924-2 .TRC
CRASH III DAMAGE ALGORITHM
90267 FILTER = BLPF 100/ 250/ -16
VCGXG1 MIN, MAX VALUES = -7.19 @ 9.75 , 7.05 @ 19.00



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
VEHICLE CG X-AXIS ACCELERATION (PERPENDICULAR TO IMPACT DIRECTION)

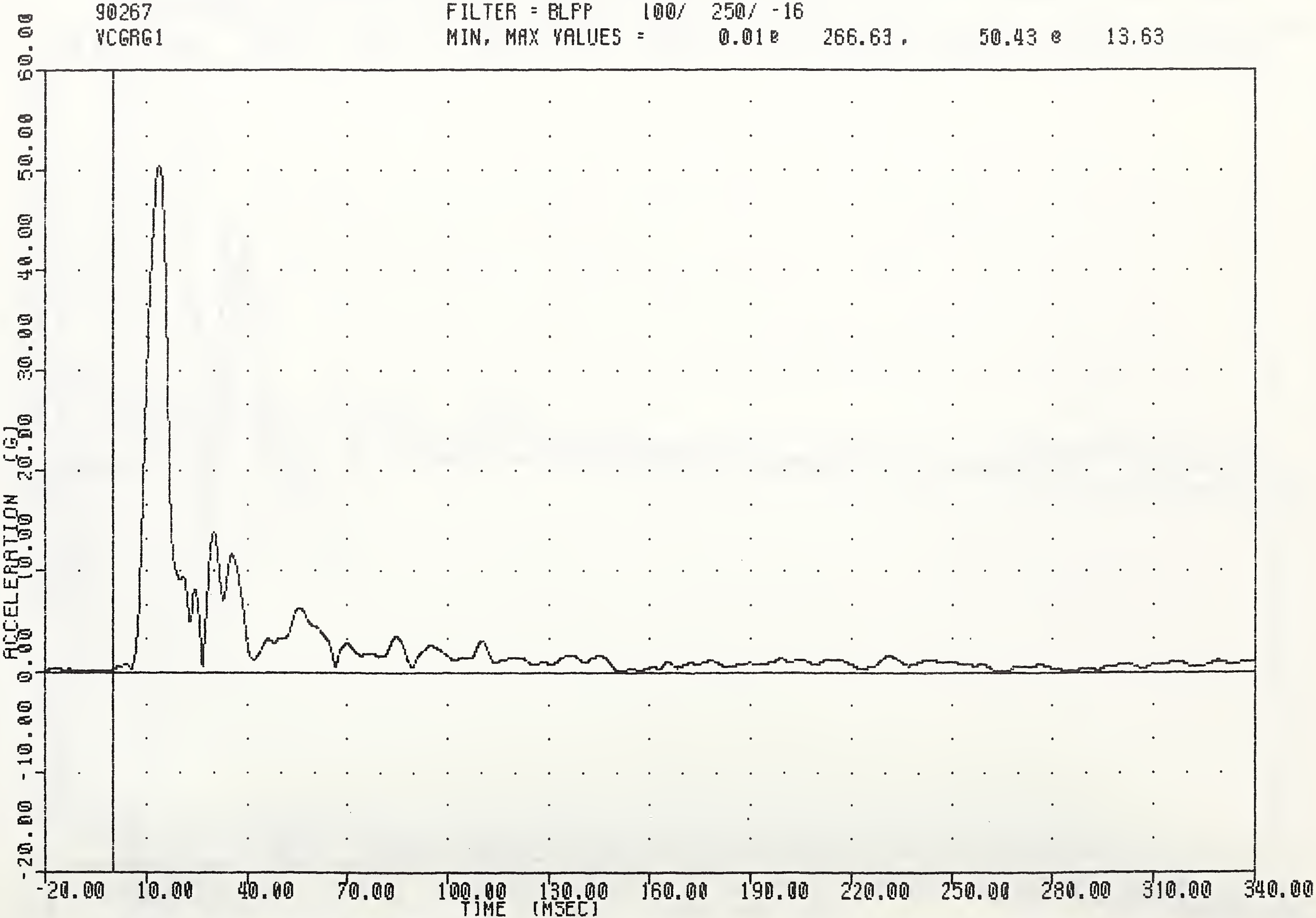
900924-2 , TRC
CRASH III DAMAGE ALGORITHM
90267
VCGYG1

FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -50.39 @ 13.75 , 8.18 @ 24.50



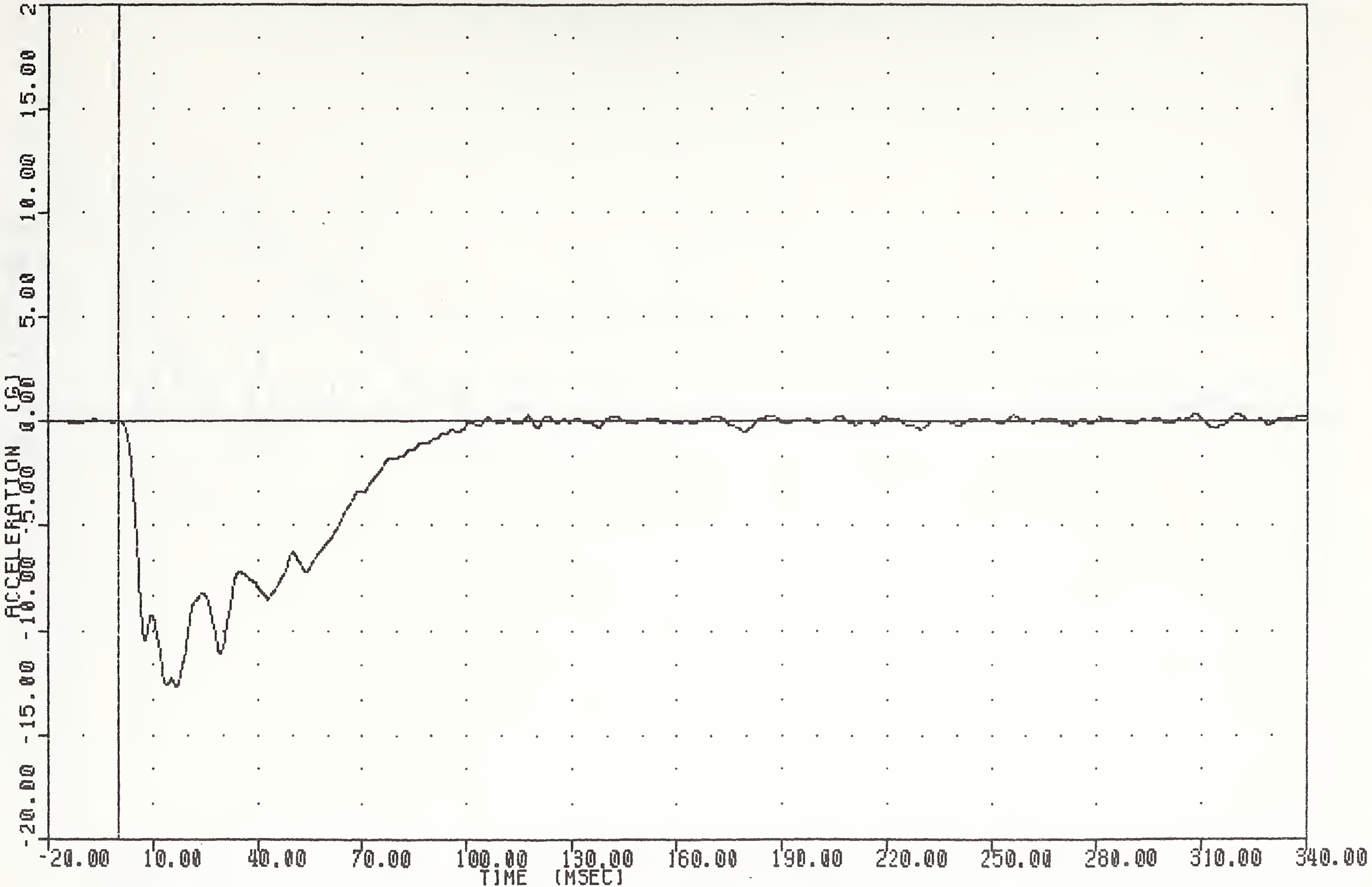
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
VEHICLE CG Y-AXIS ACCELERATION (IMPACT DIRECTION)

900924-2 , TRC
CRASH III DAMAGE ALGORITHM
90267 FILTER = BLPP 100/ 250/ -16
VCGRG1 MIN, MAX VALUES = 0.01 @ 266.63 , 50.43 @ 13.63



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
VEHICLE CG RESULTANT ACCELERATION

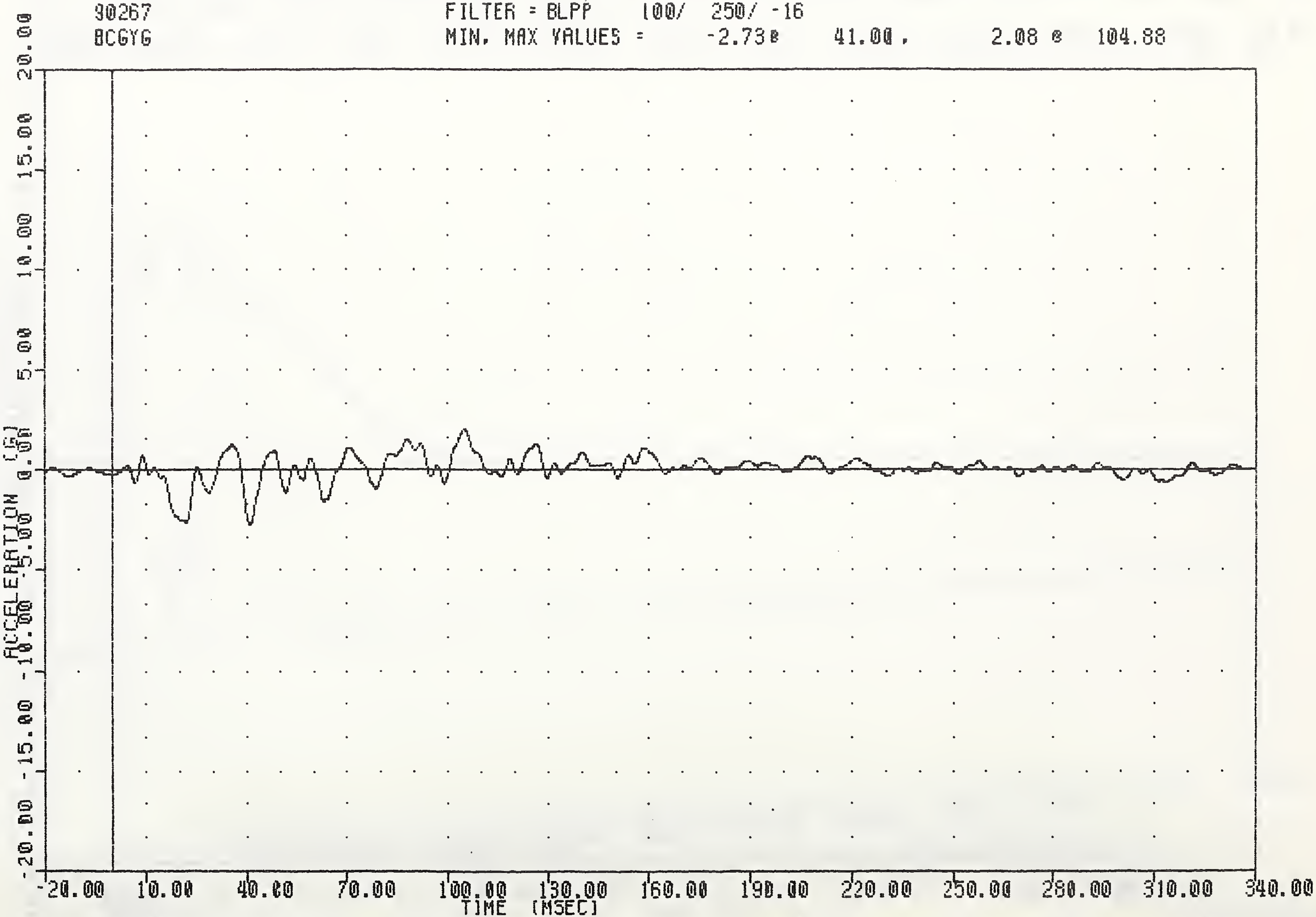
900924-2 , TRC
CRASH III DAMAGE ALGORITHM
90267 FILTER = BLPP 100/ 250/ -16
BCGXG MIN. MAX VALUES = -12.71 @ 16.75 , 0.36 @ 308.13



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
MOVING BARRIER CENTER OF GRAVITY X-AXIS ACCELERATION

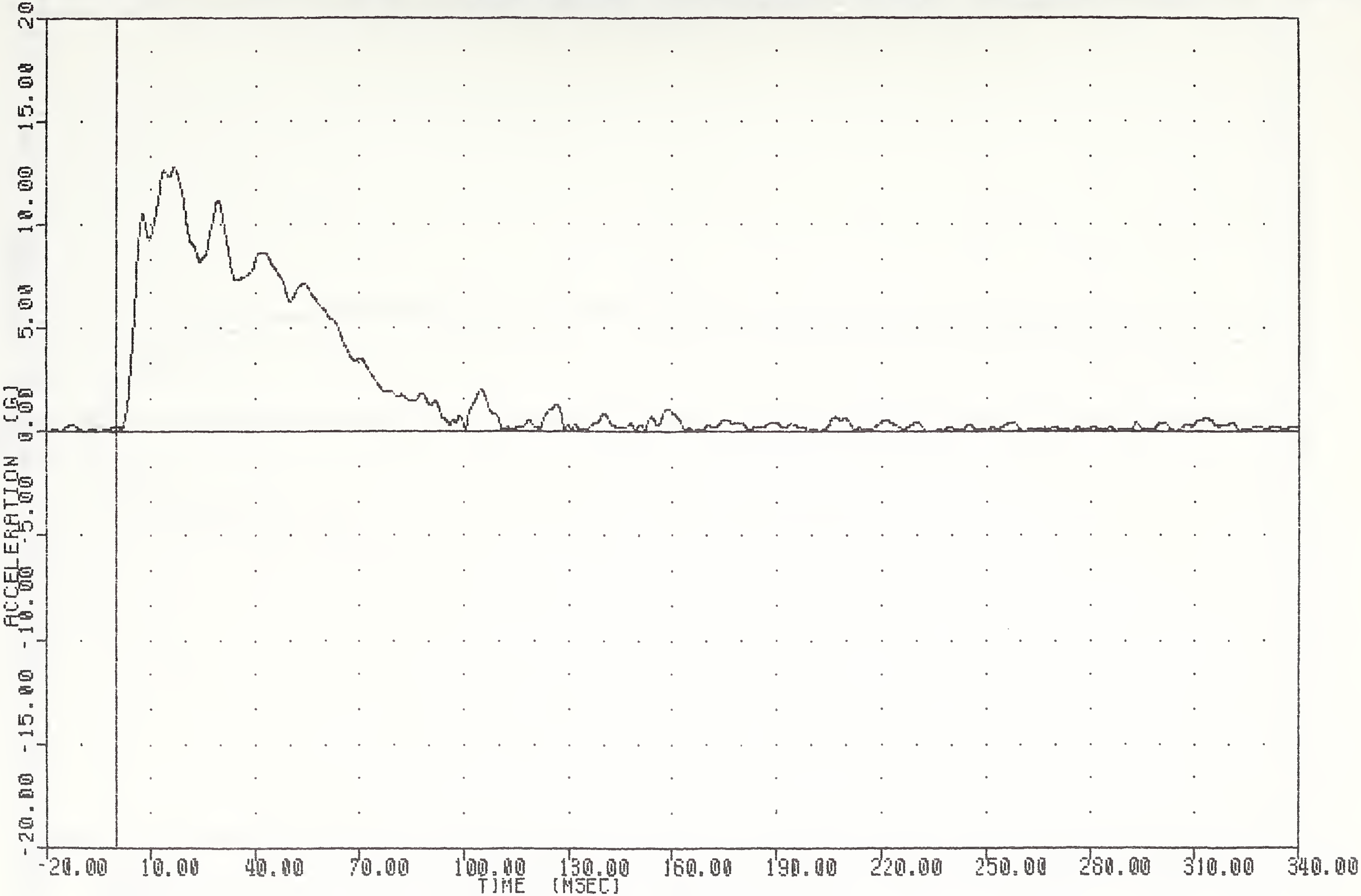
900924-2 , TRC
CRASH III DAMAGE ALGORITHN
90267
BCGYG

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -2.73 @ 41.00 , 2.08 @ 104.88



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
MOVING BARRIER CENTER OF GRAVITY Y-AXIS ACCELERATION

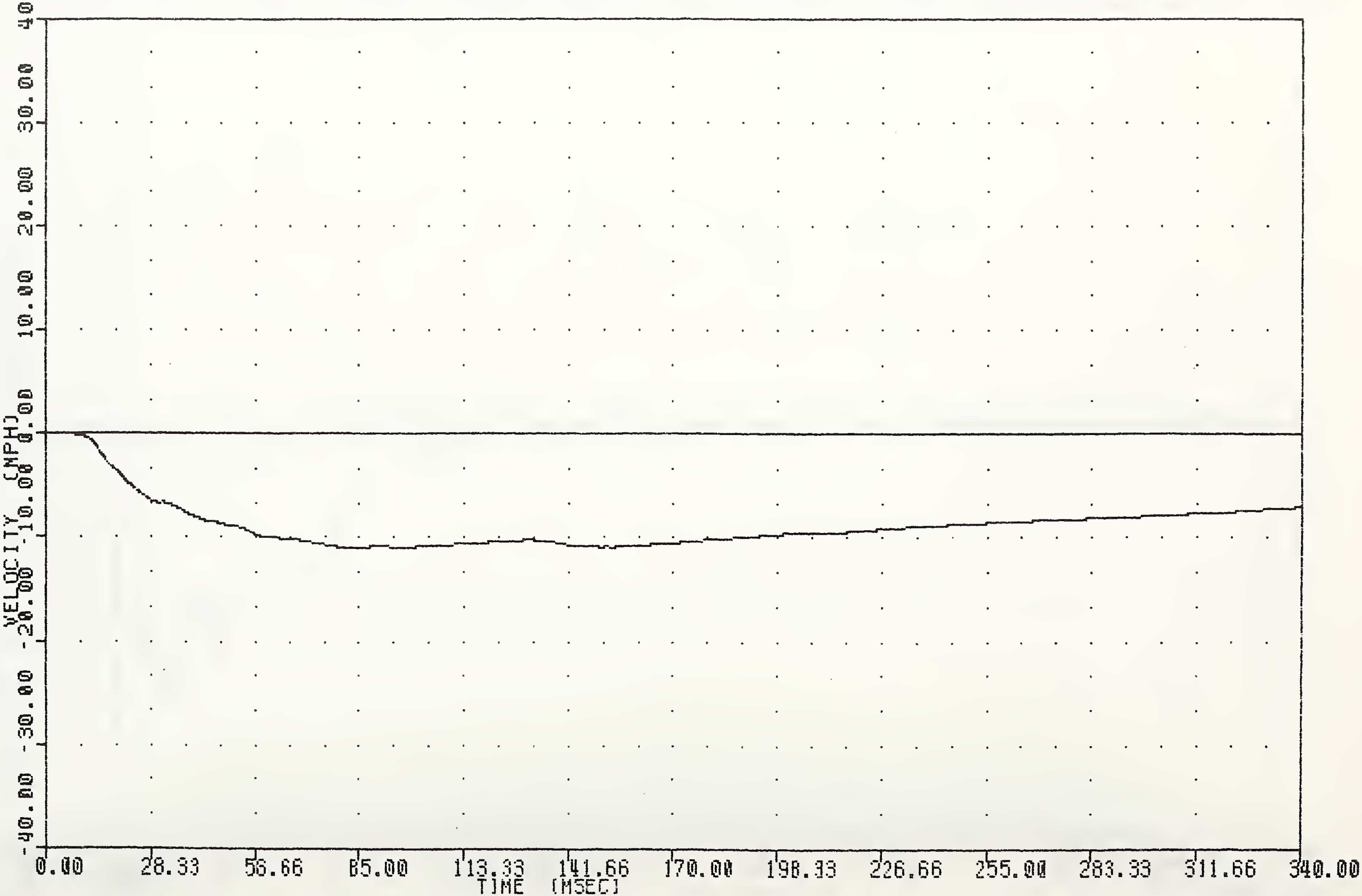
900924-2 , TRC
CRASH III DAMAGE ALGORITHN
90267 FILTER = BLPP 100/ 250/ -16
BCGRG MIN, MAX VALUES = 0.00 @ -19.50 , 12.78 @ 16.88



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
MOVING BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION

900924-2 , TRC
CRASH III DAMAGE ALGORITHM
90267
AFSYV1

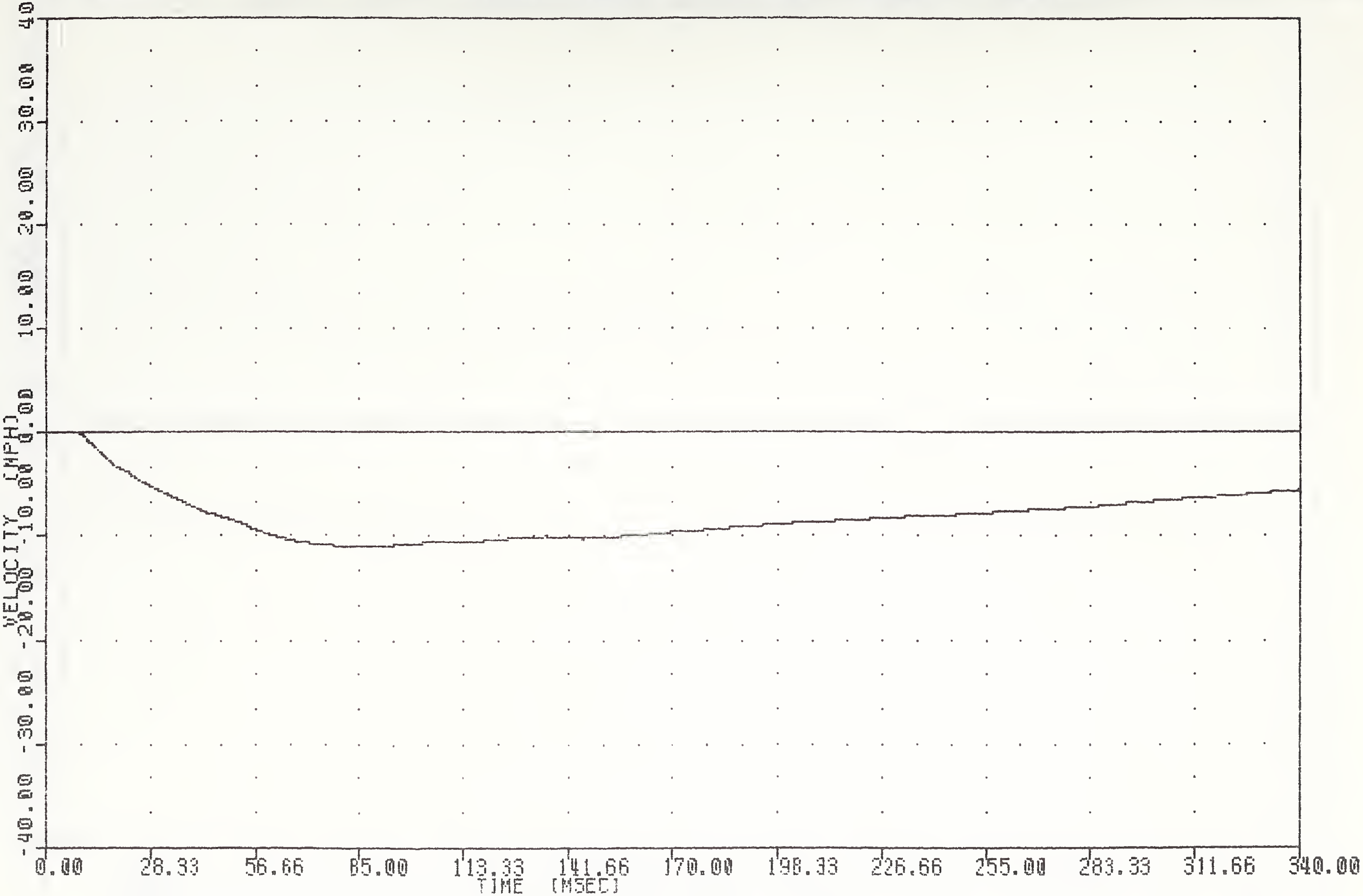
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -11.02 @ 83.50 , 0.00 @ 5.50



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
RIGHT FRONT SILL Y-AXIS VELOCITY

900924-2 , TRC
CRASH III DAMAGE ALGORITHM
90267
ARSYV1

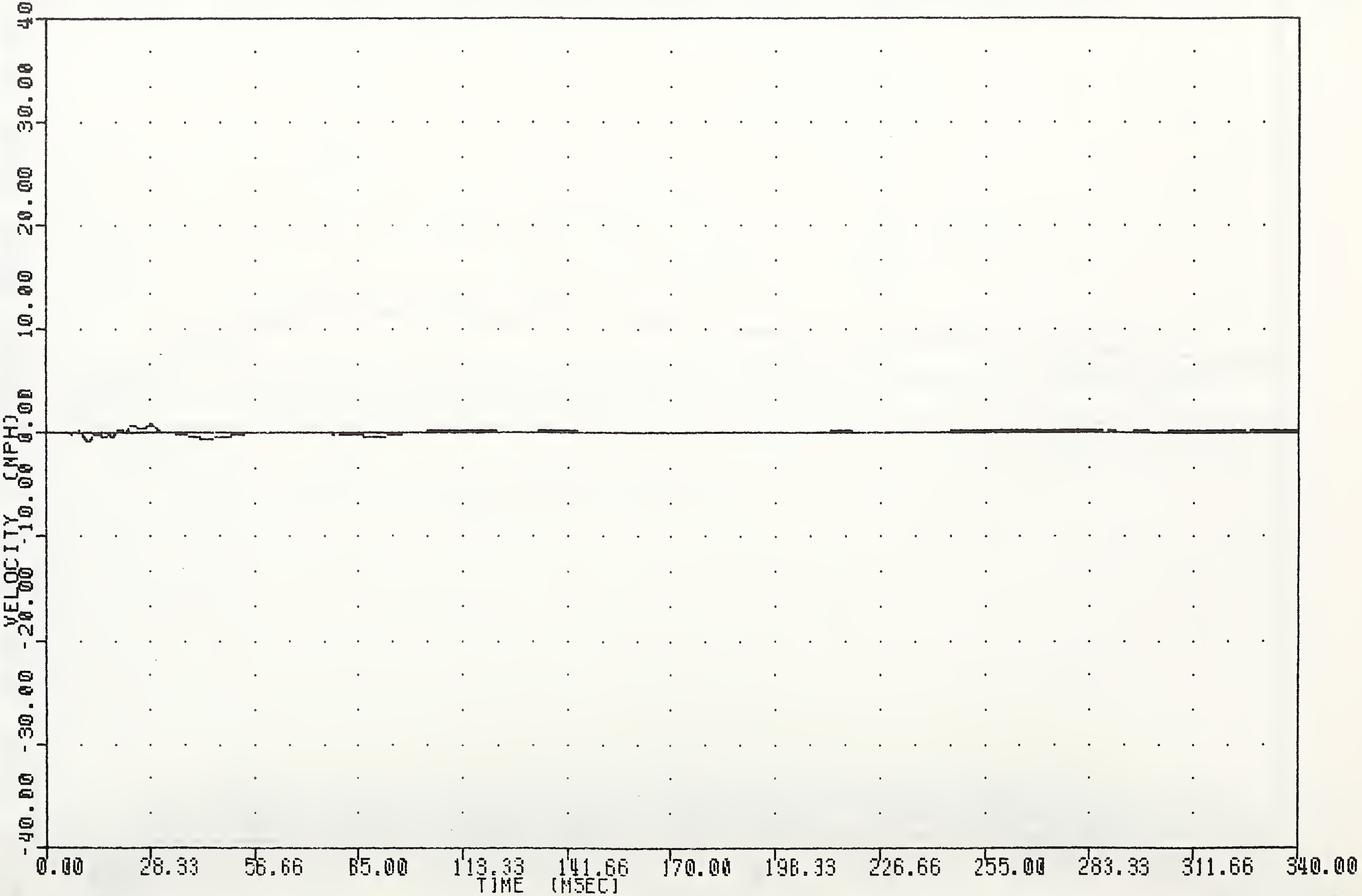
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -11.02 @ 85.00 , 0.01 @ 6.25



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
RIGHT REAR SILL Y-AXIS VELOCITY

900924-2 , TRC
CRASH III DAMAGE ALGORITHM
90267
VCGXV1

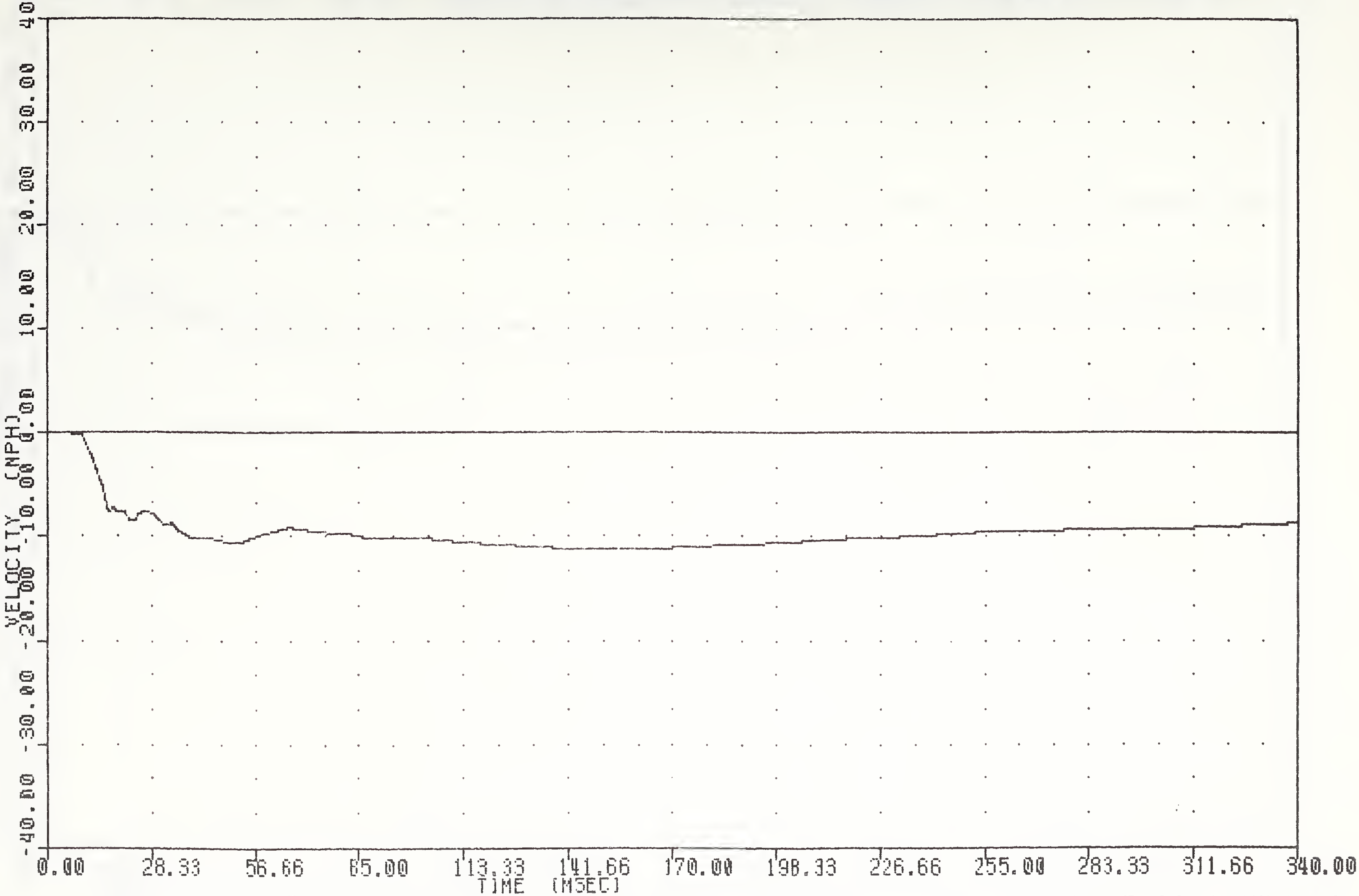
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -0.78 @ 11.25 , 0.80 @ 28.50



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
VEHICLE CG X-AXIS VELOCITY (PERPENDICULAR TO IMPACT DIRECTION)

900924-2 , TRC
CRASH III DAMAGE ALGORITHM
90267
VCGYV1

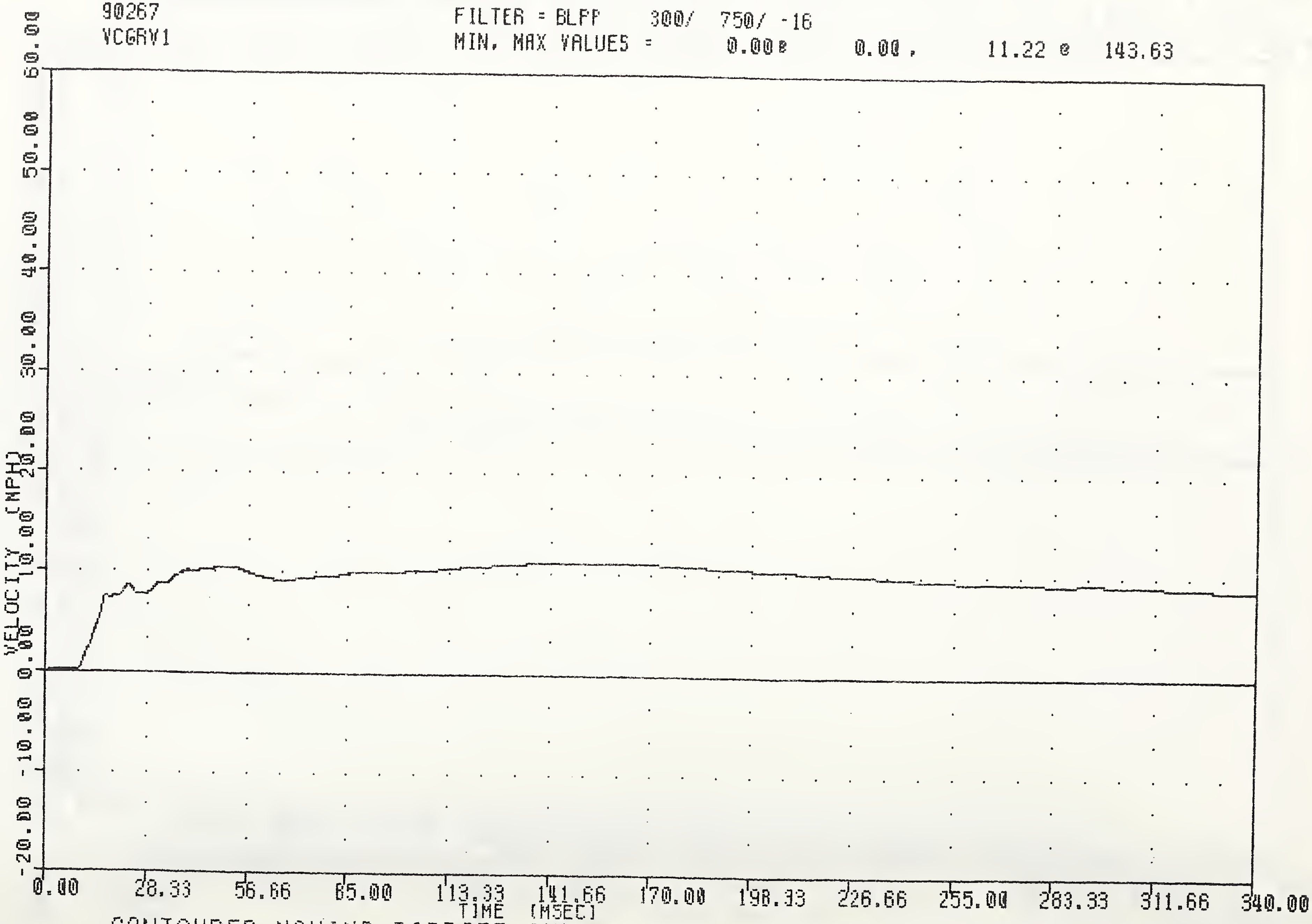
FILTER = BLPF 300/ 750/ -16
MIN. MAX VALUES = -11.22 @ 143.75 , 0.01 @ 4.88



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
VEHICLE CG Y-AXIS VELOCITY (IMPACT DIRECTION)

900924-2 , TRC
CRASH III DAMAGE ALGORITHN
90267
VCGRV1

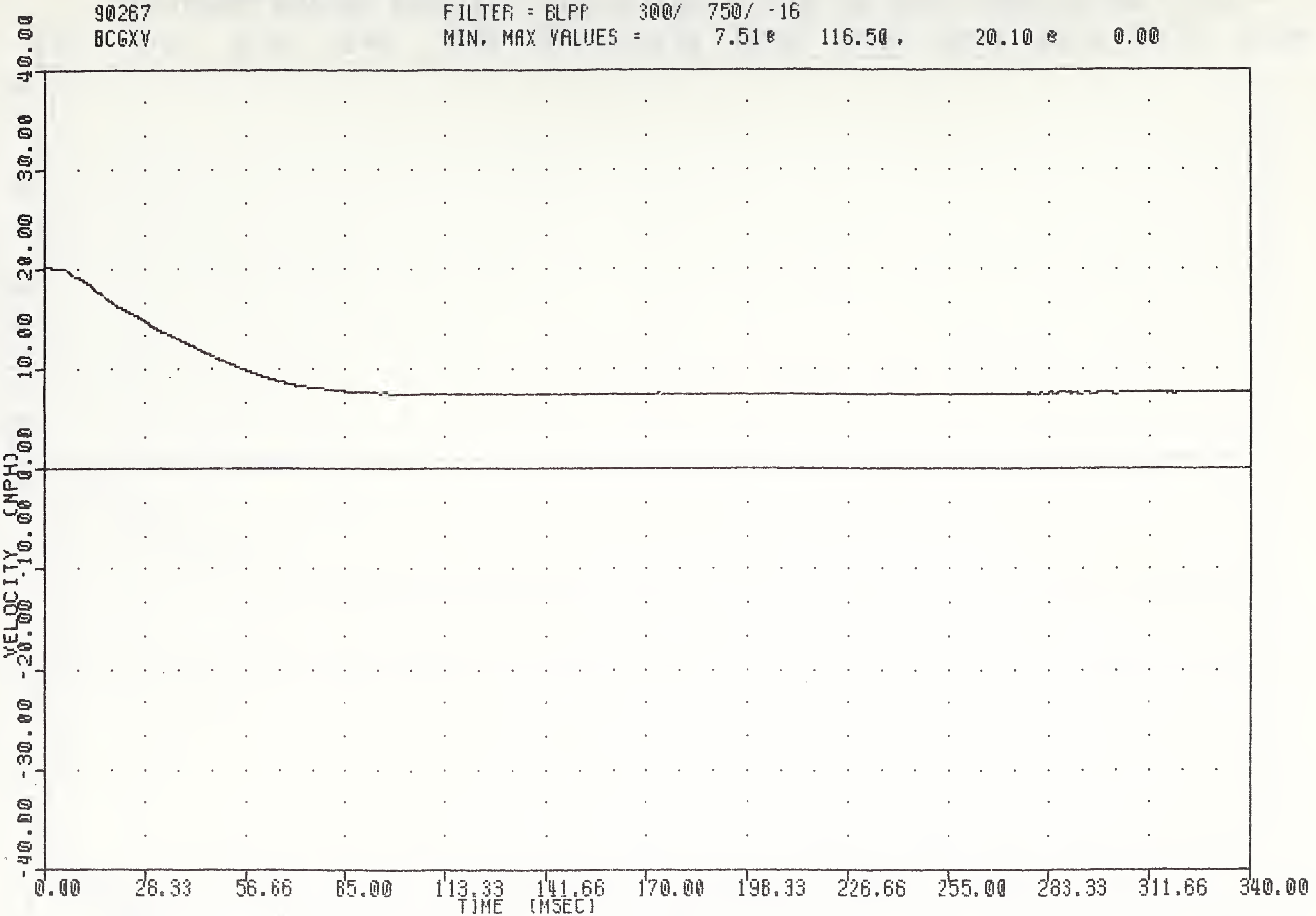
FILTER = BLFP 300/ 750/ -16
MIN, MAX VALUES = 0.00 @ 0.00 , 11.22 @ 143.63



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
VEHICLE CG RESULTANT VELOCITY

900924-2 , TRC
CRASH III DAMAGE ALGORITHM
90267
BCGXV

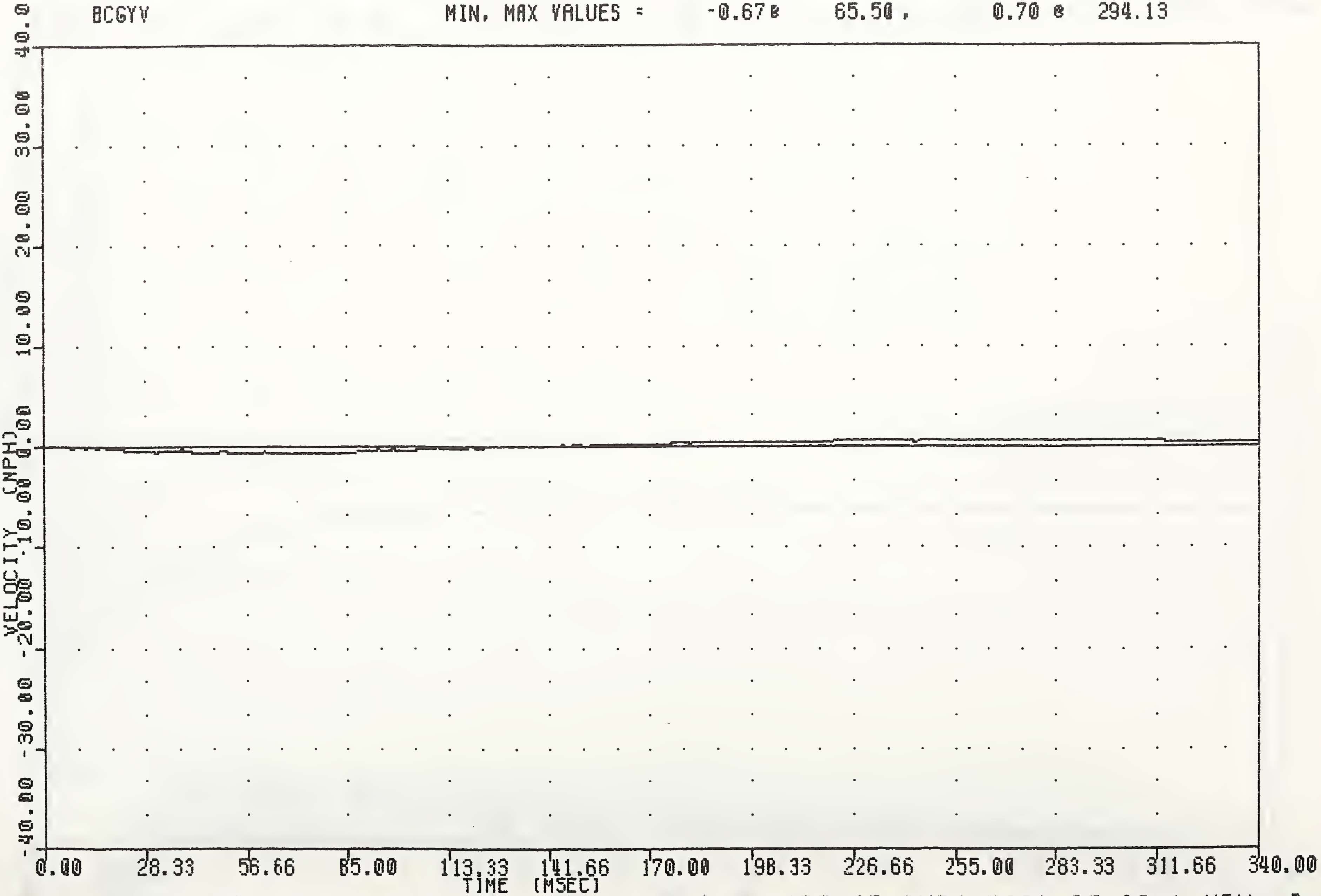
FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = 7.51 @ 116.50 , 20.10 @ 0.00



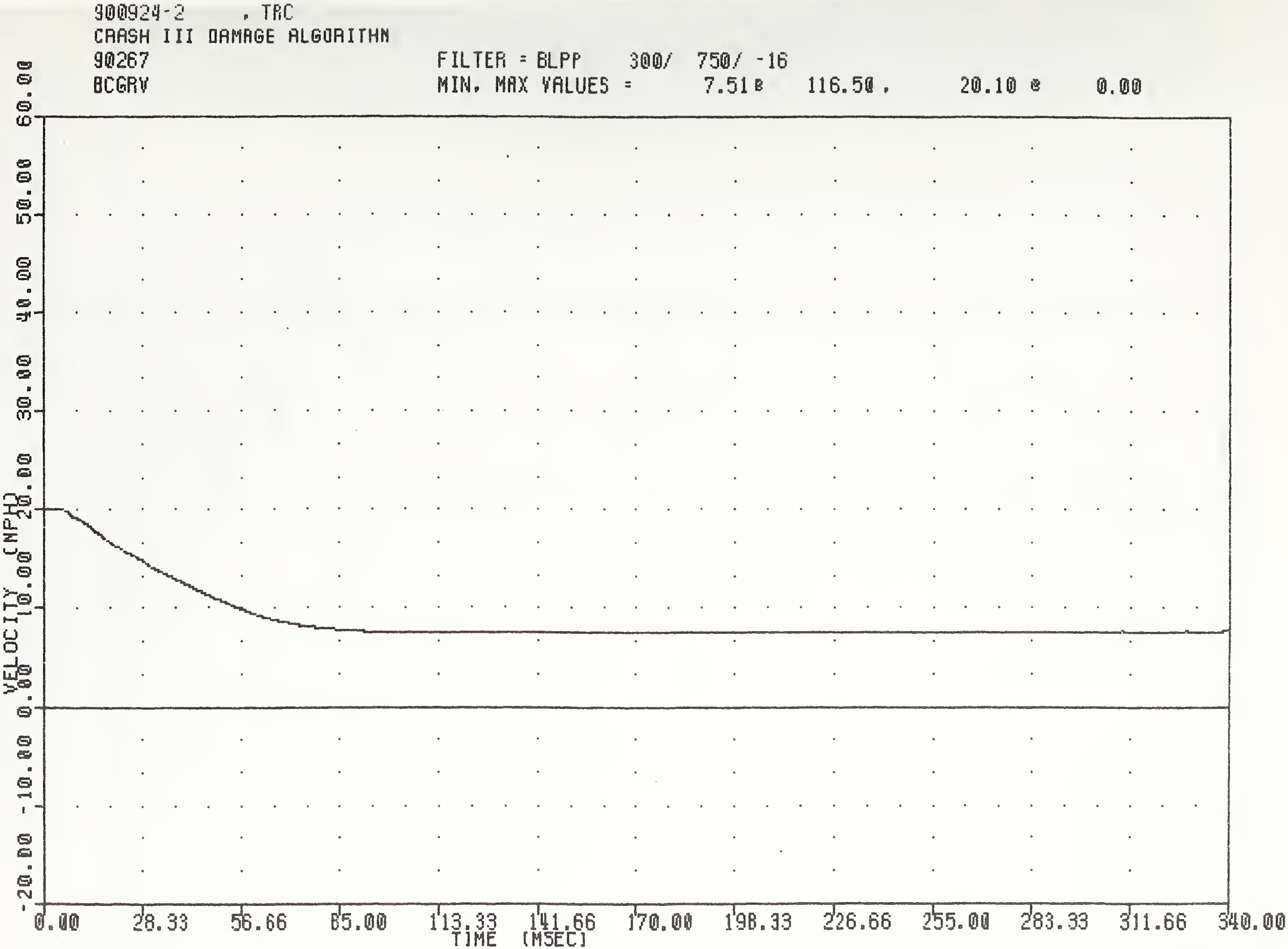
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
MOVING BARRIER CENTER OF GRAVITY X-AXIS VELOCITY

900924-2 , TRC
CRASH III DAMAGE ALGORITHM
90267
BCGYV

FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -0.67 @ 65.50 , 0.70 @ 294.13



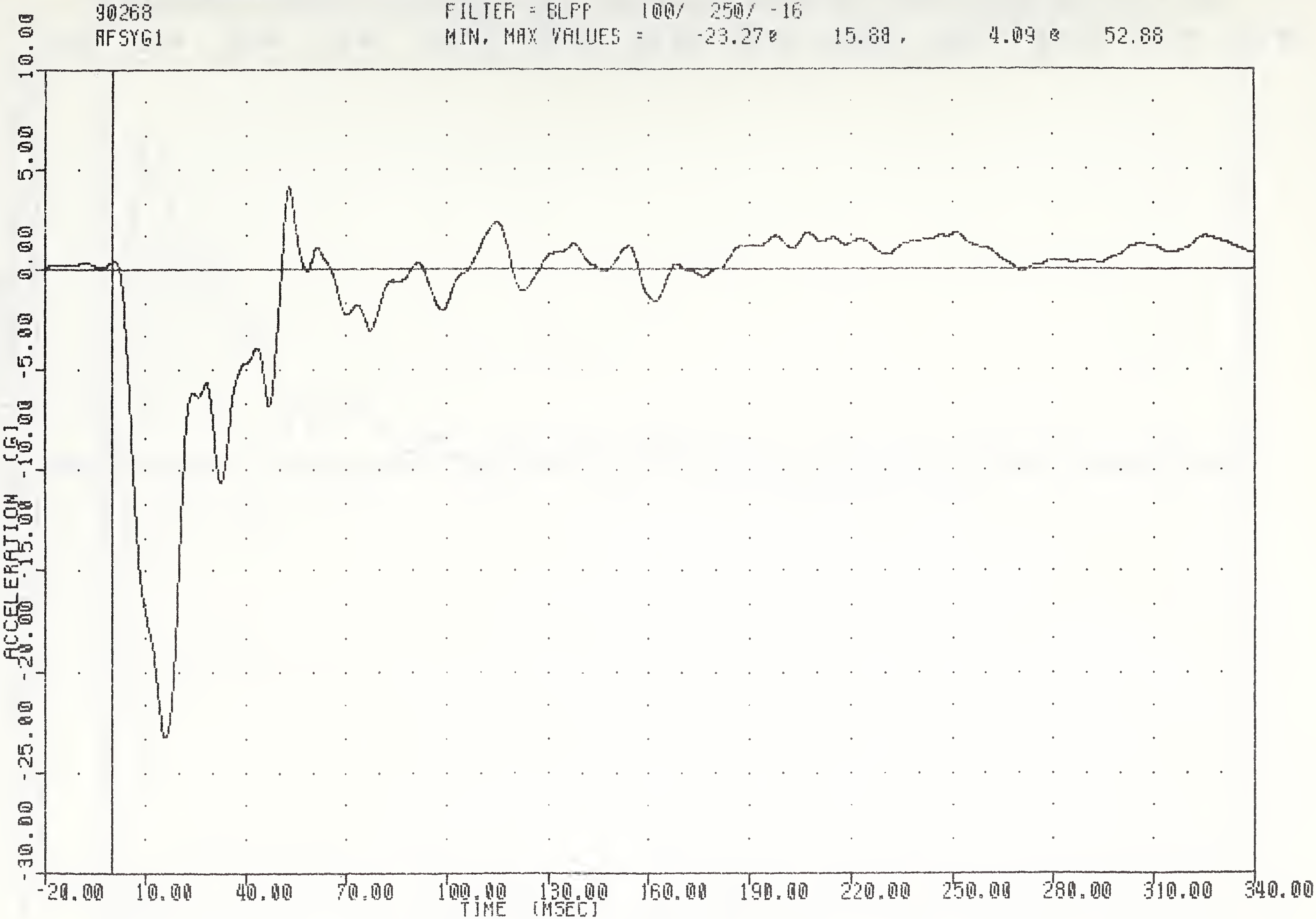
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
MOVING BARRIER CENTER OF GRAVITY Y-AXIS VELOCITY



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.1 MPH #2
MOVING BARRIER CENTER OF GRAVITY RESULTANT VELOCITY

TEST #900925-1

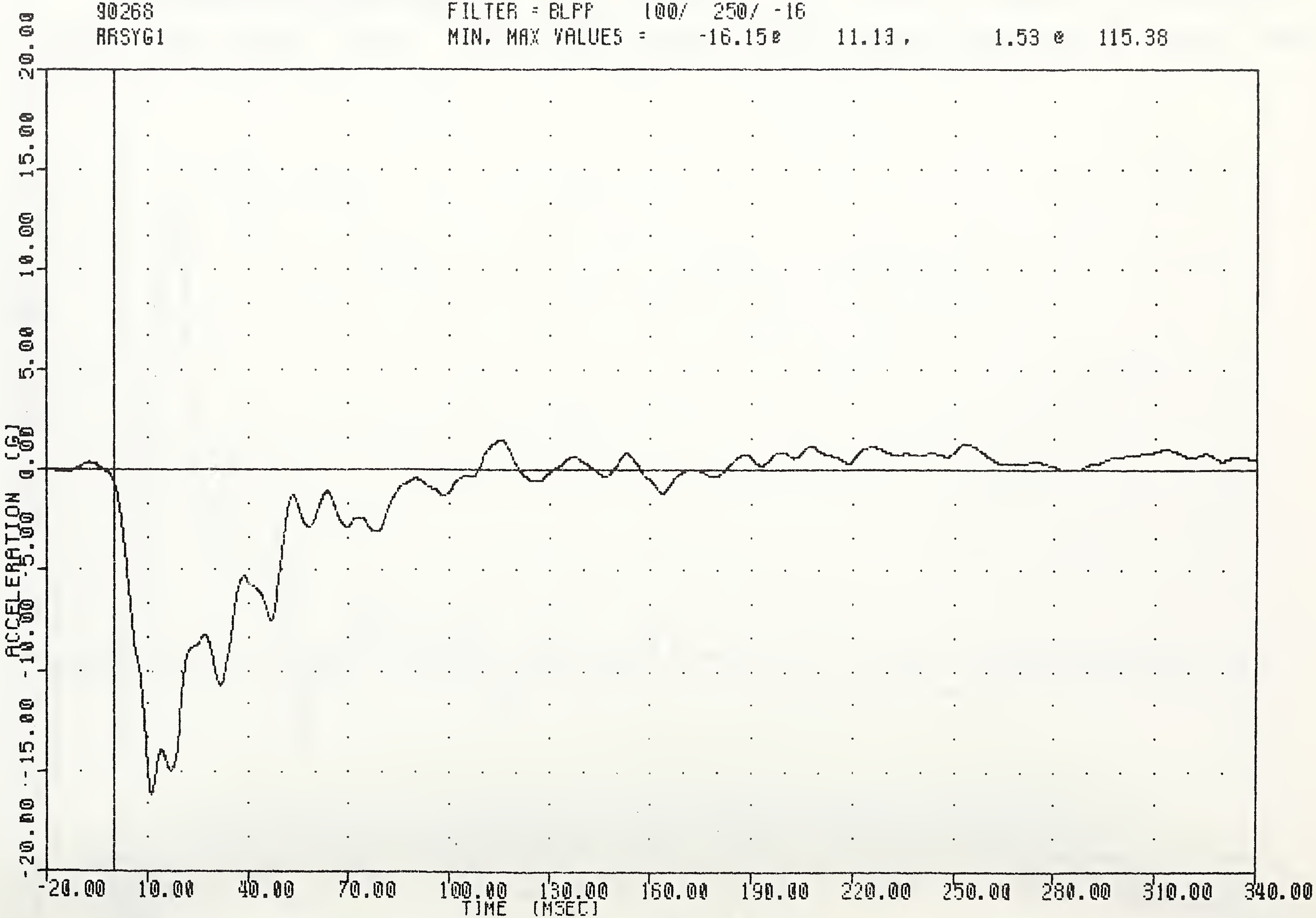
900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPF 100/ 250/ -16
AFSYG1 MIN, MAX VALUES = -23.27 @ 15.88 , 4.09 @ 52.88



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
RIGHT FRONT SILL Y-AXIS ACCELERATION

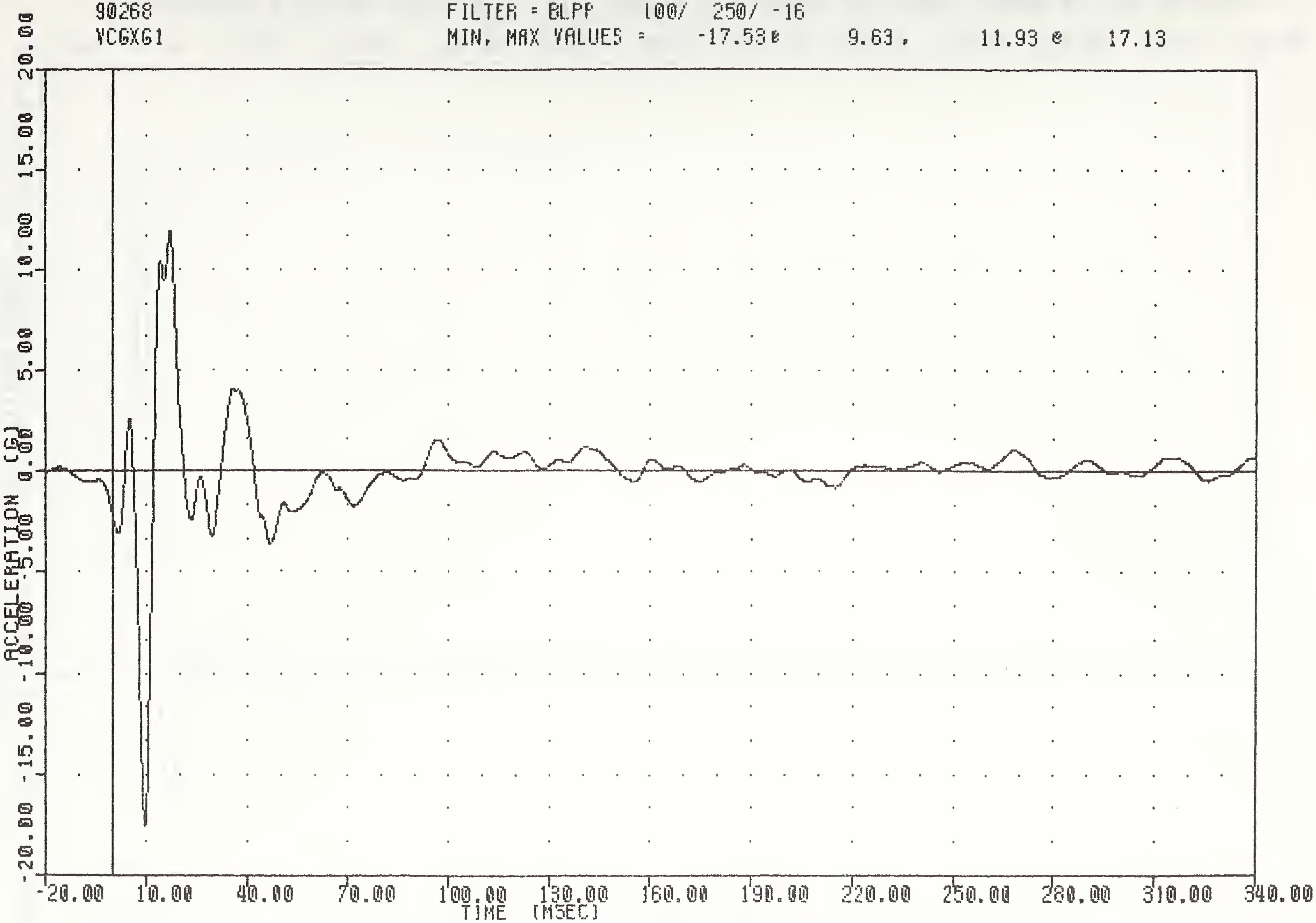
900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268
RRSYG1

FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -16.15@ 11.13, 1.53 @ 115.38



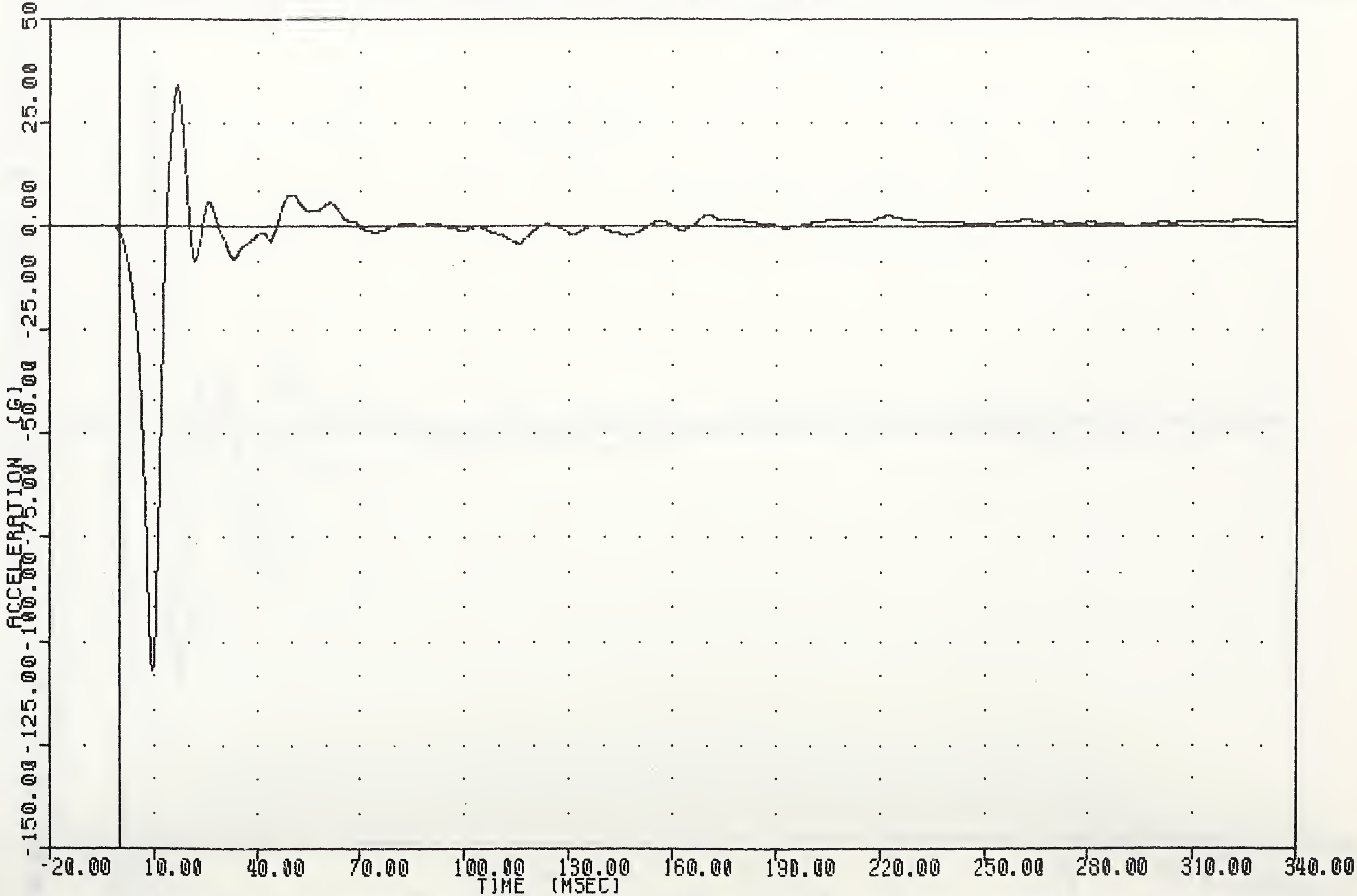
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
RIGHT REAR SILL Y-AXIS ACCELERATION

900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPF 100/ 250/ -16
VCGX61 MIN, MAX VALUES = -17.53 @ 9.63 , 11.93 @ 17.13



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
VEHICLE CG X-AXIS ACCELERATION (PERPENDICULAR TO IMPACT DIRECTION)

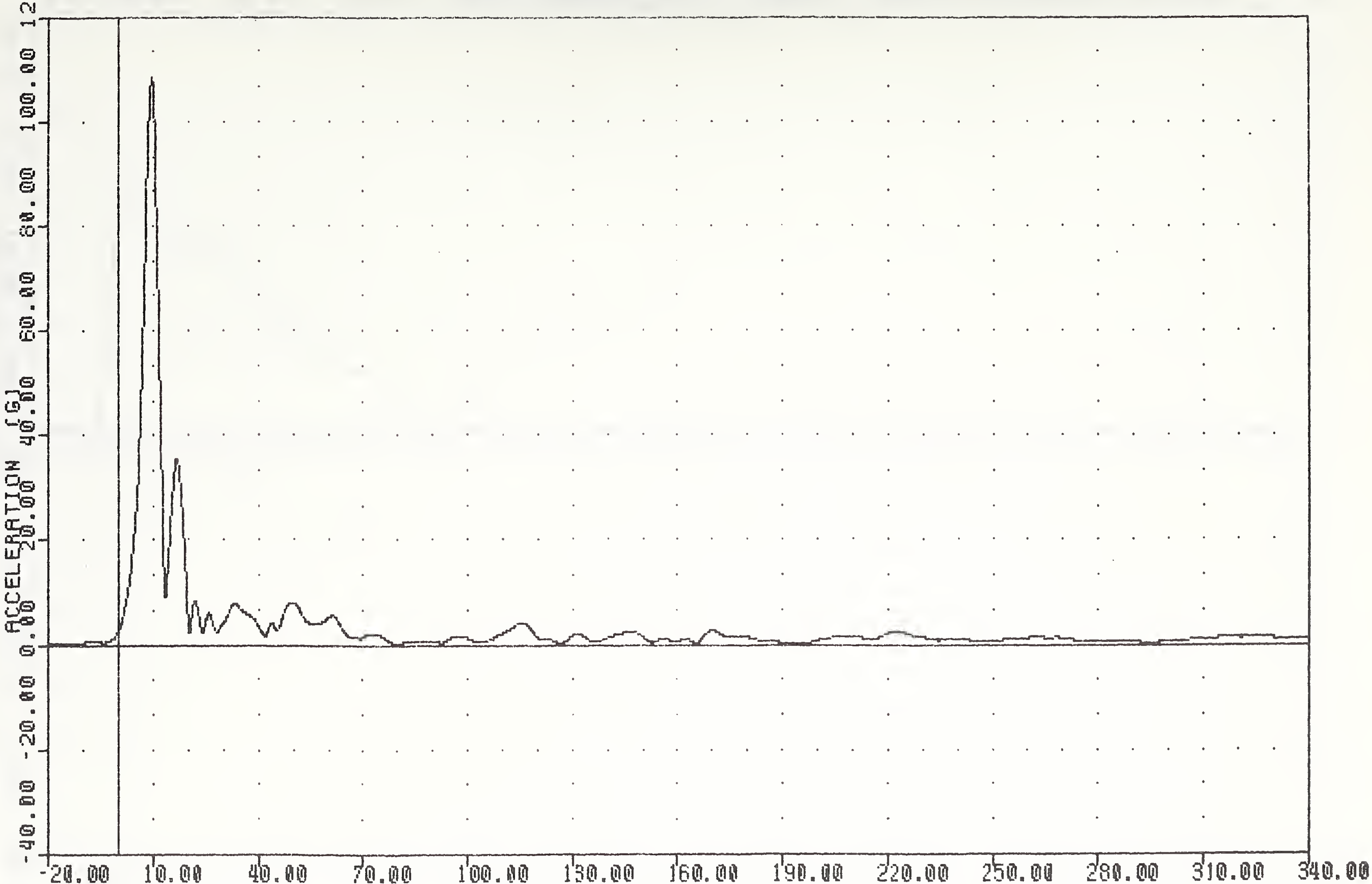
900925-1 . TRC
CRASH III DAMAGE ALGORITHN
90268 FILTER = BLPP 100/ 250/ -16
VCGYG1 MIN. MAX VALUES = -106.97 @ 9.50 , 33.66 @ 16.63



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
VEHICLE CG Y-AXIS ACCELERATION (IMPACT DIRECTION)

900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268
VCGRG1

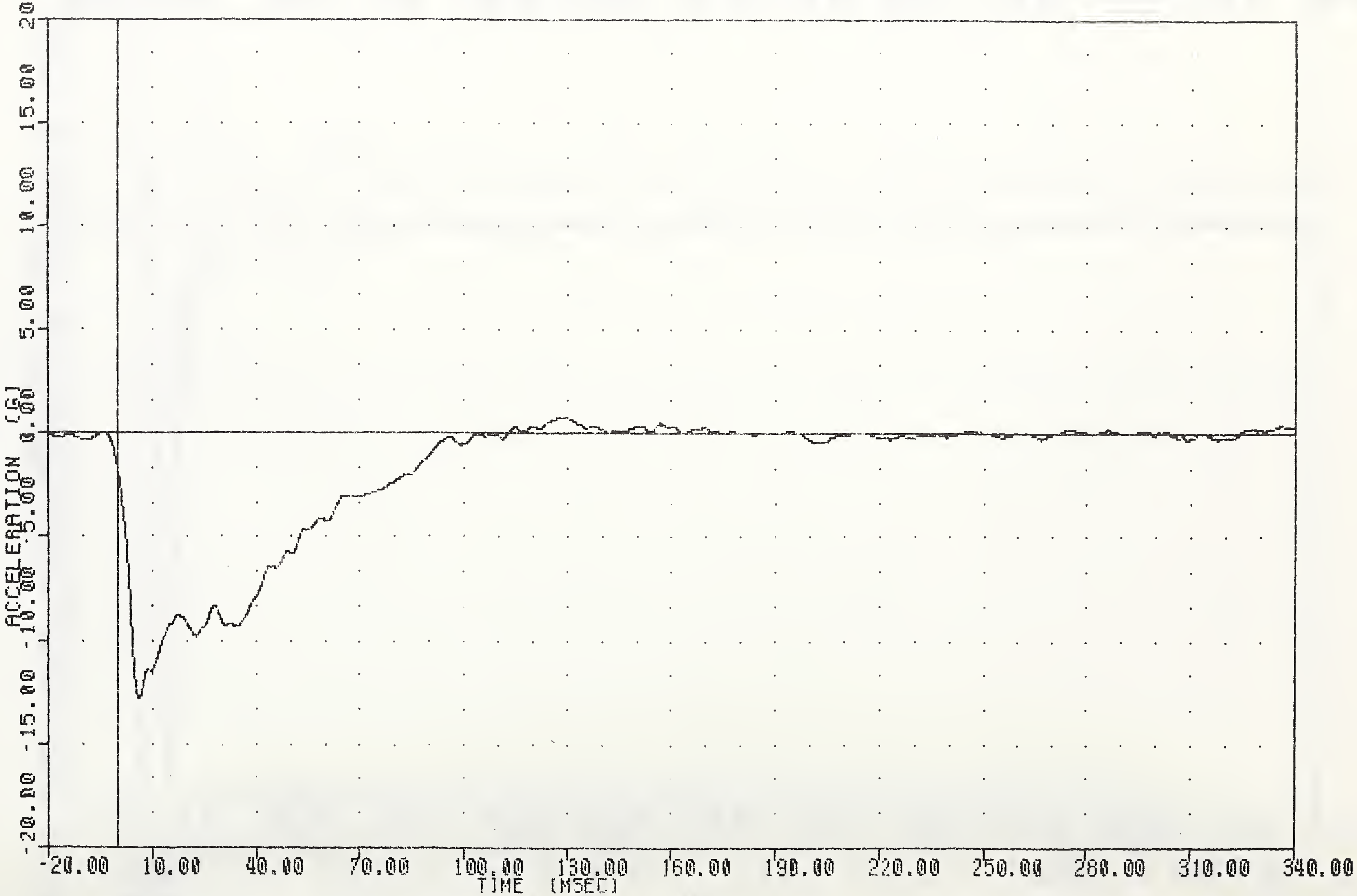
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = 0.04 @ 190.13 , 108.39 @ 9.50



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
VEHICLE CG RESULTANT ACCELERATION

900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268
BCGXG

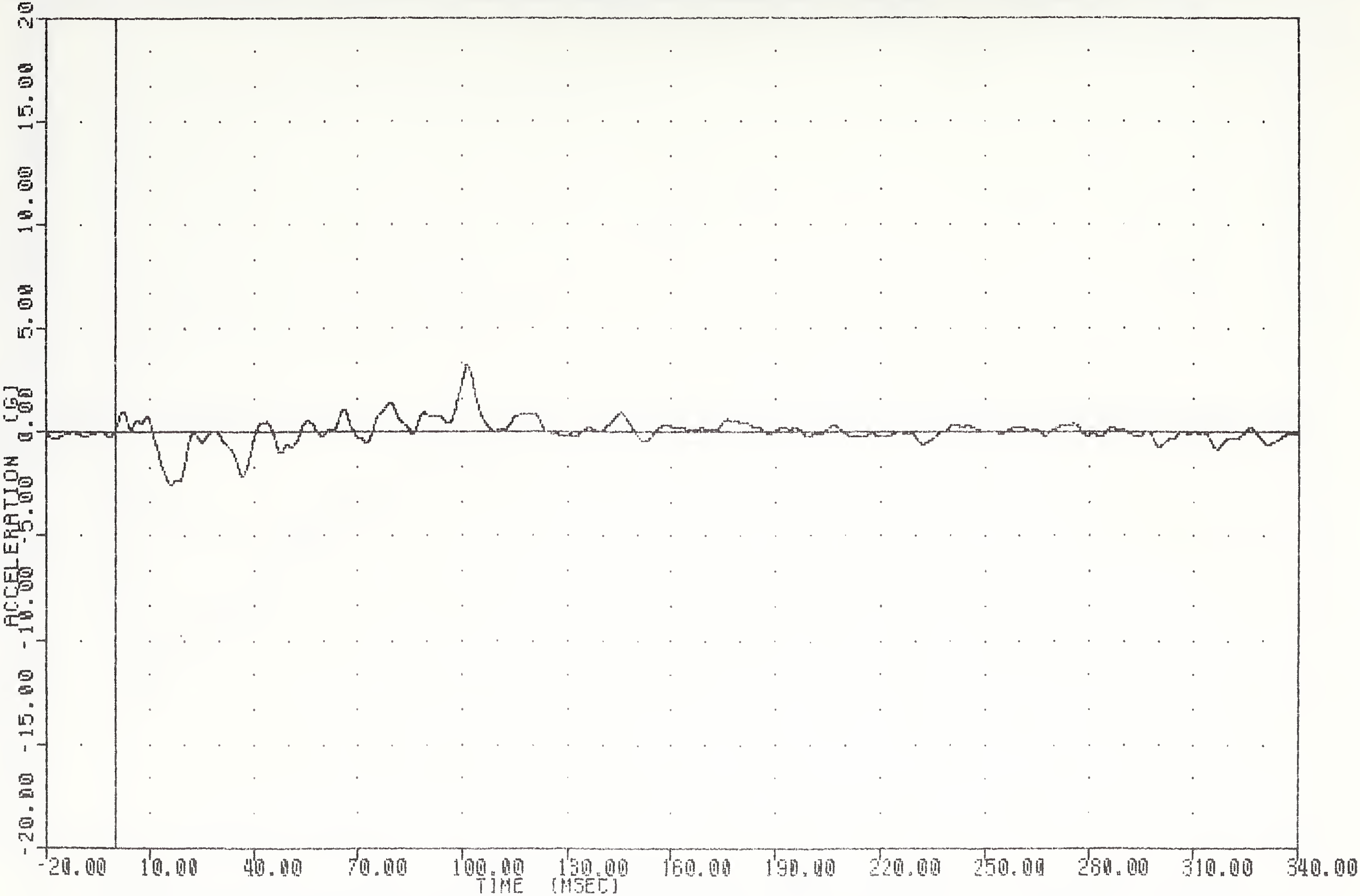
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -12.85 @ 6.00 , 0.81 @ 129.25



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
MOVING BARRIER CENTER OF GRAVITY X-AXIS ACCELERATION

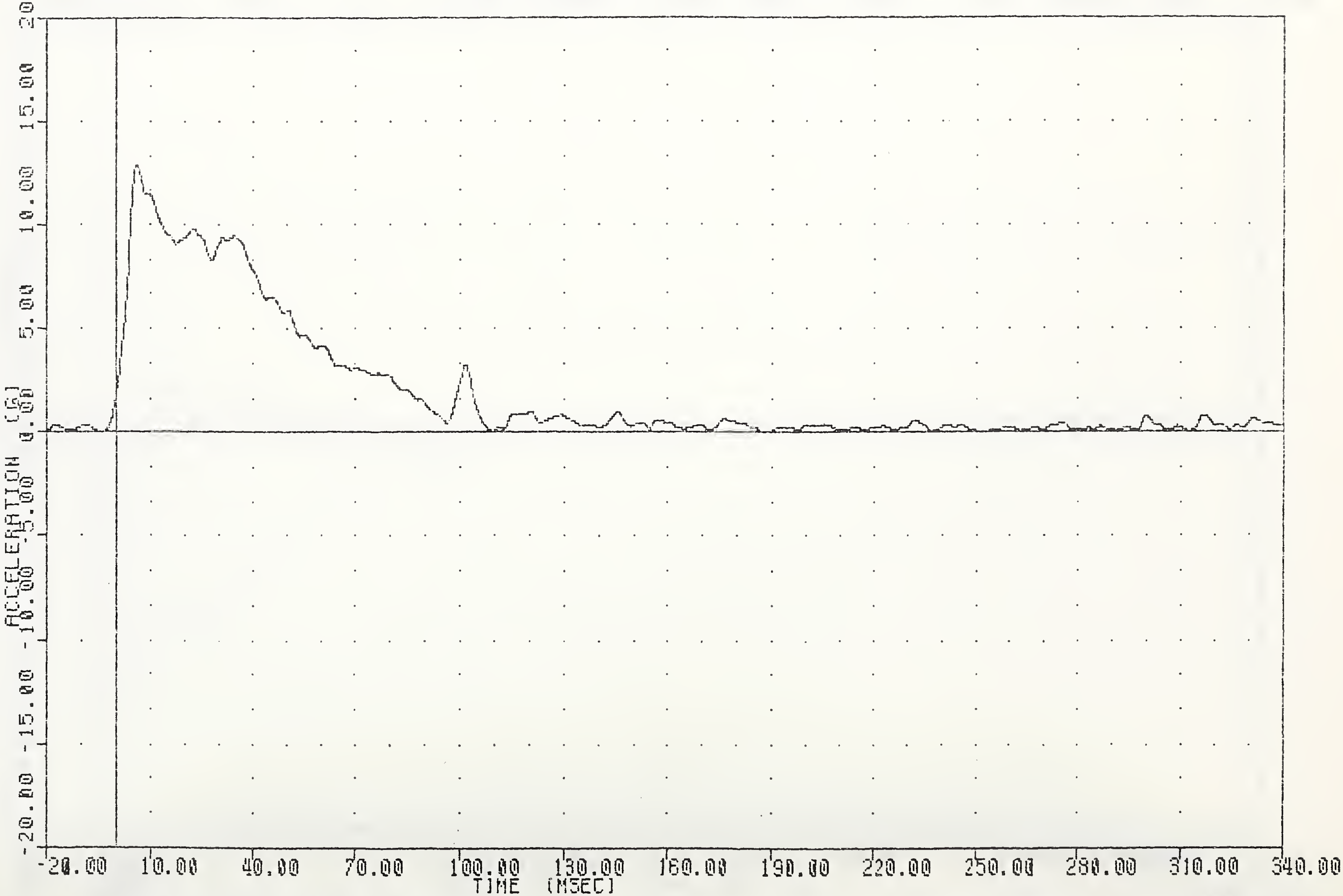
900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268
BCGYG

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -2.52 @ 16.00 , 3.20 @ 101.50



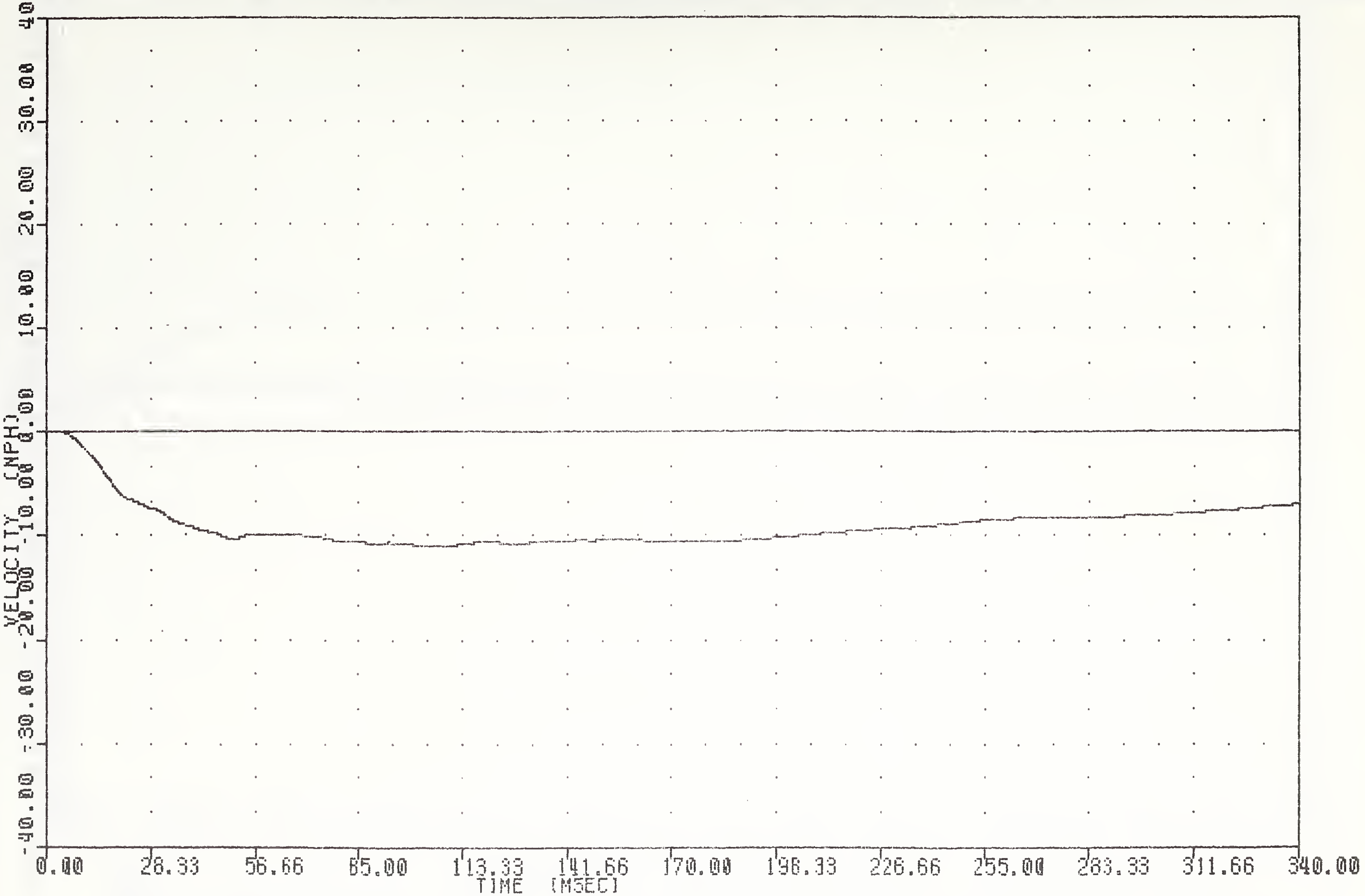
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
MOVING BARRIER CENTER OF GRAVITY Y-AXIS ACCELERATION

900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPF 100/ 250/ -16
BCGRG MIN, MAX VALUES = 0.01 @ 189.13 , 12.87 @ 6.00



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
MOVING BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION

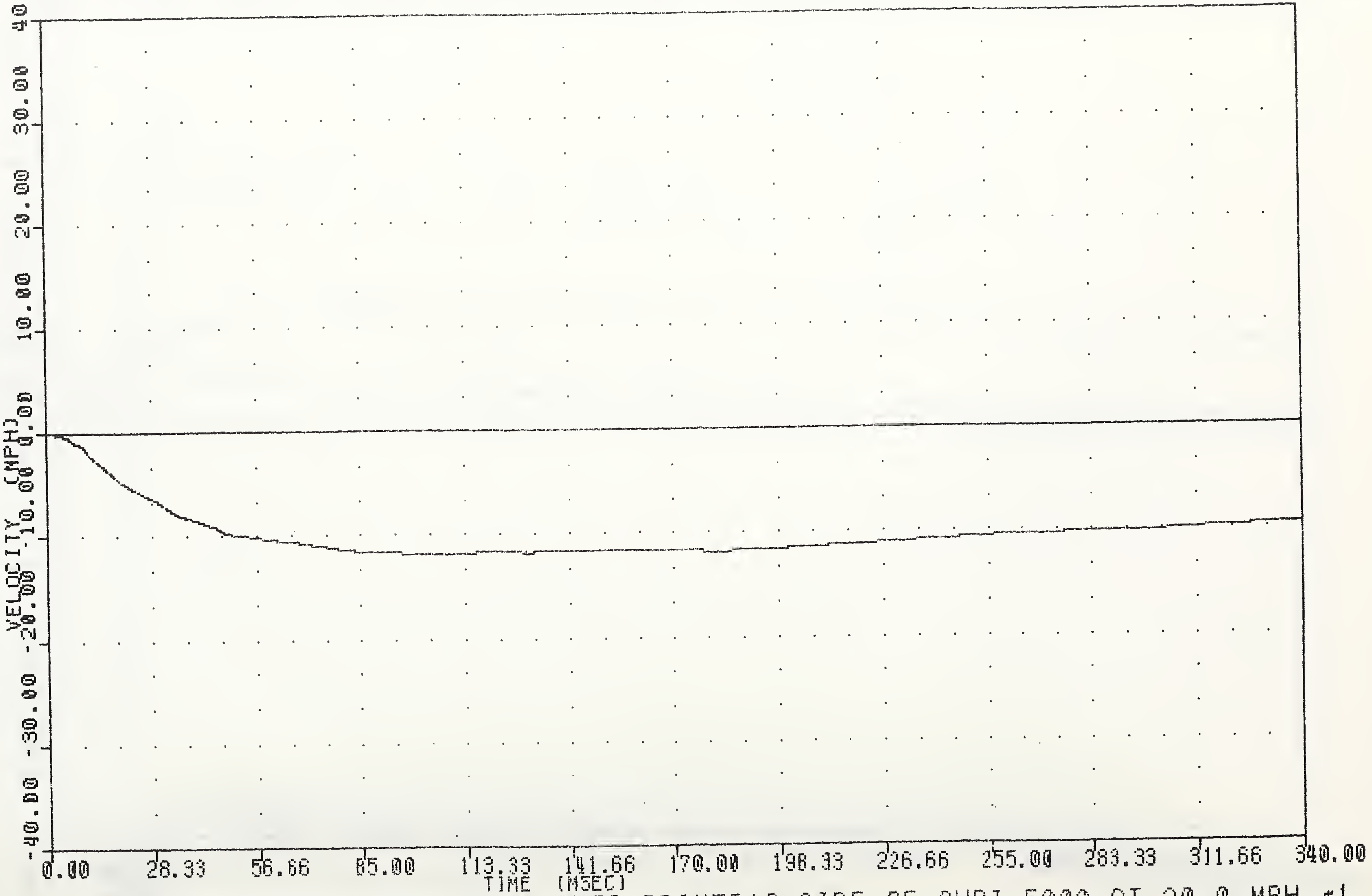
900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPF 300/ 750/ -16
AFSYV1 MIN, MAX VALUES = -10.97 @ 106.38 , 0.02 @ 2.88



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
RIGHT FRONT SILL Y-AXIS VELOCITY

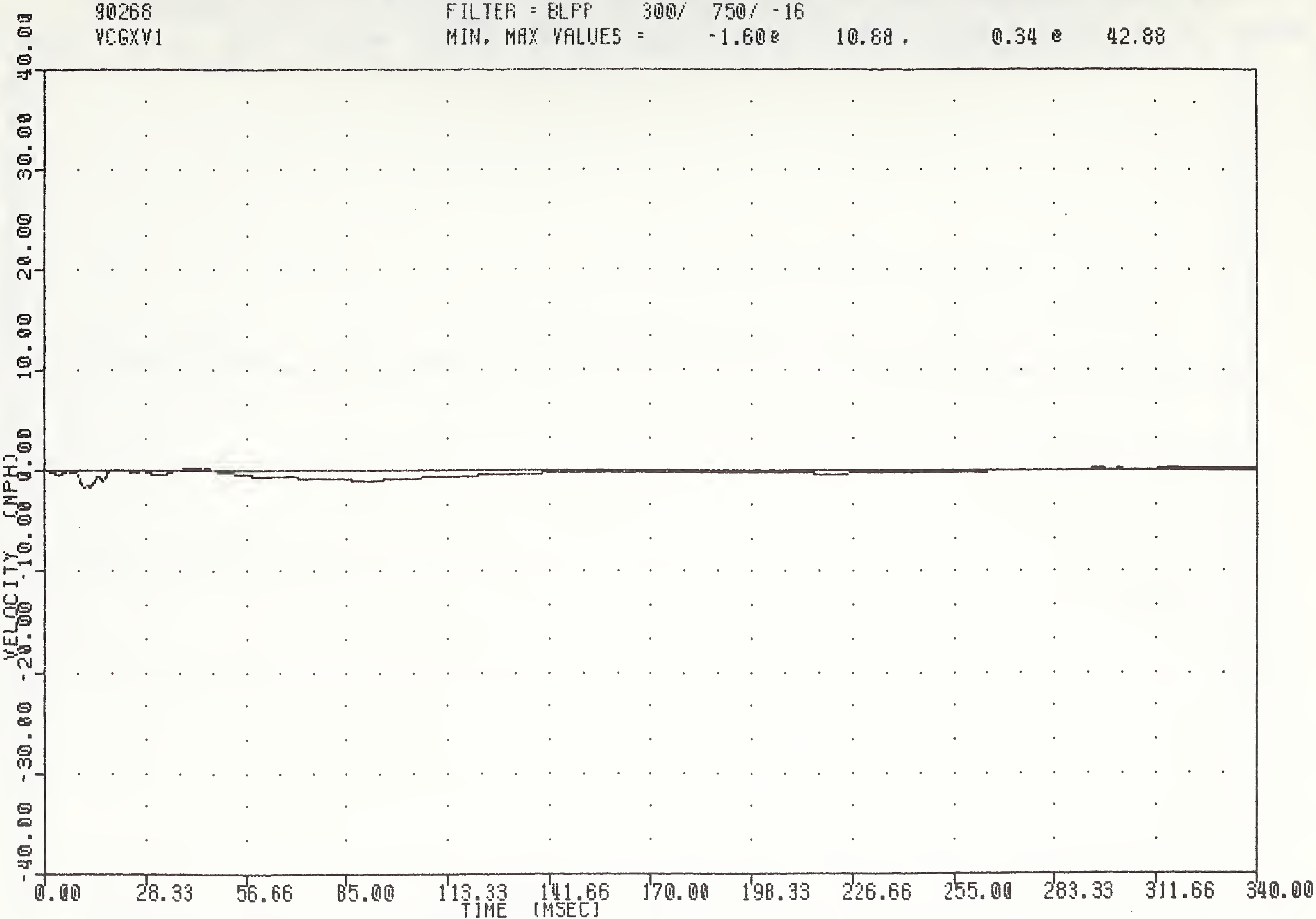
900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268
ARSYV1

FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = -11.91 @ 109.50 , 0.00 @ 0.00



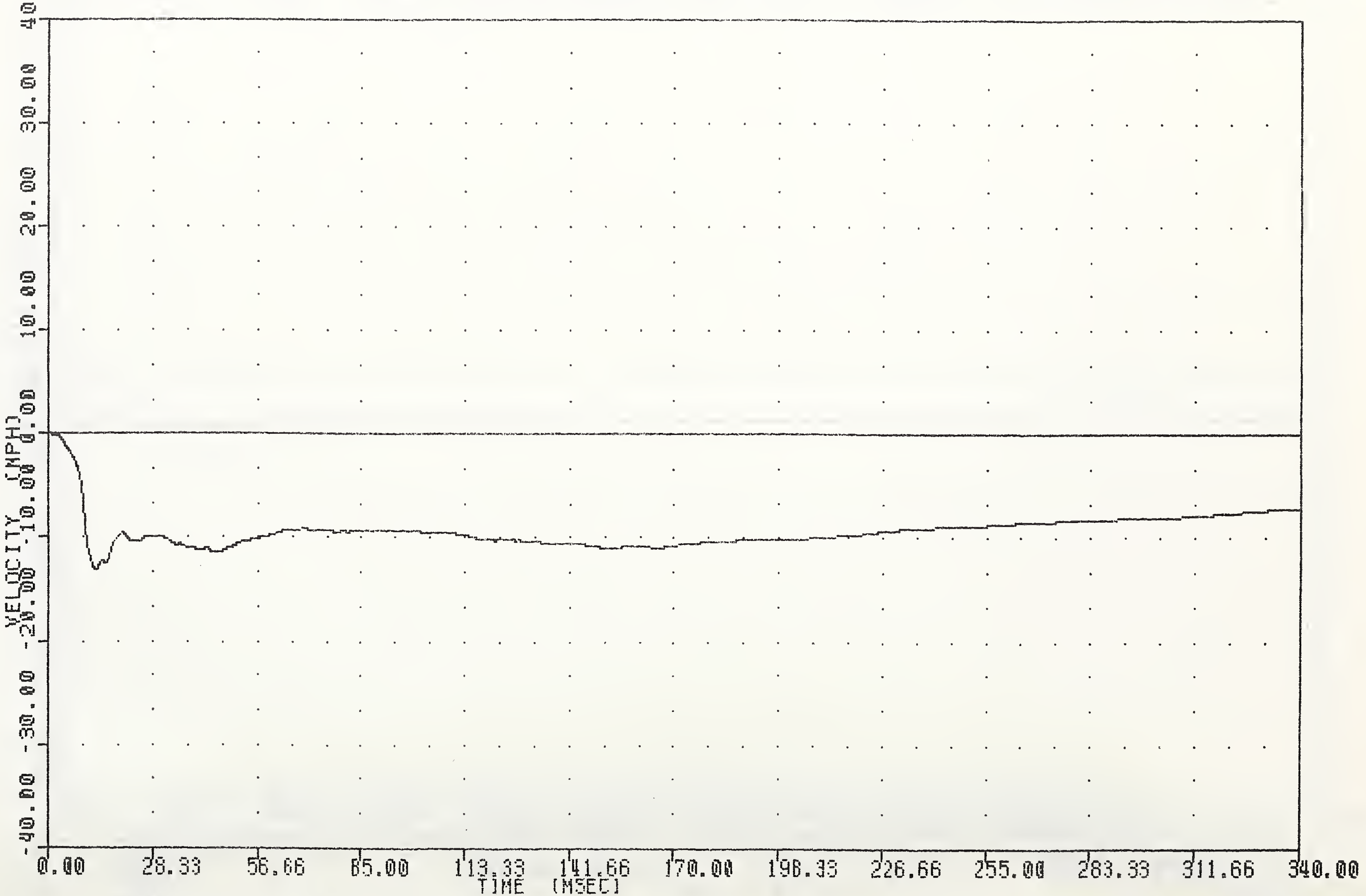
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
RIGHT REAR SILL Y-AXIS VELOCITY

900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPF 300/ 750/ -16
VCGXV1 MIN, MAX VALUES = -1.60 @ 10.68 , 0.34 @ 42.88



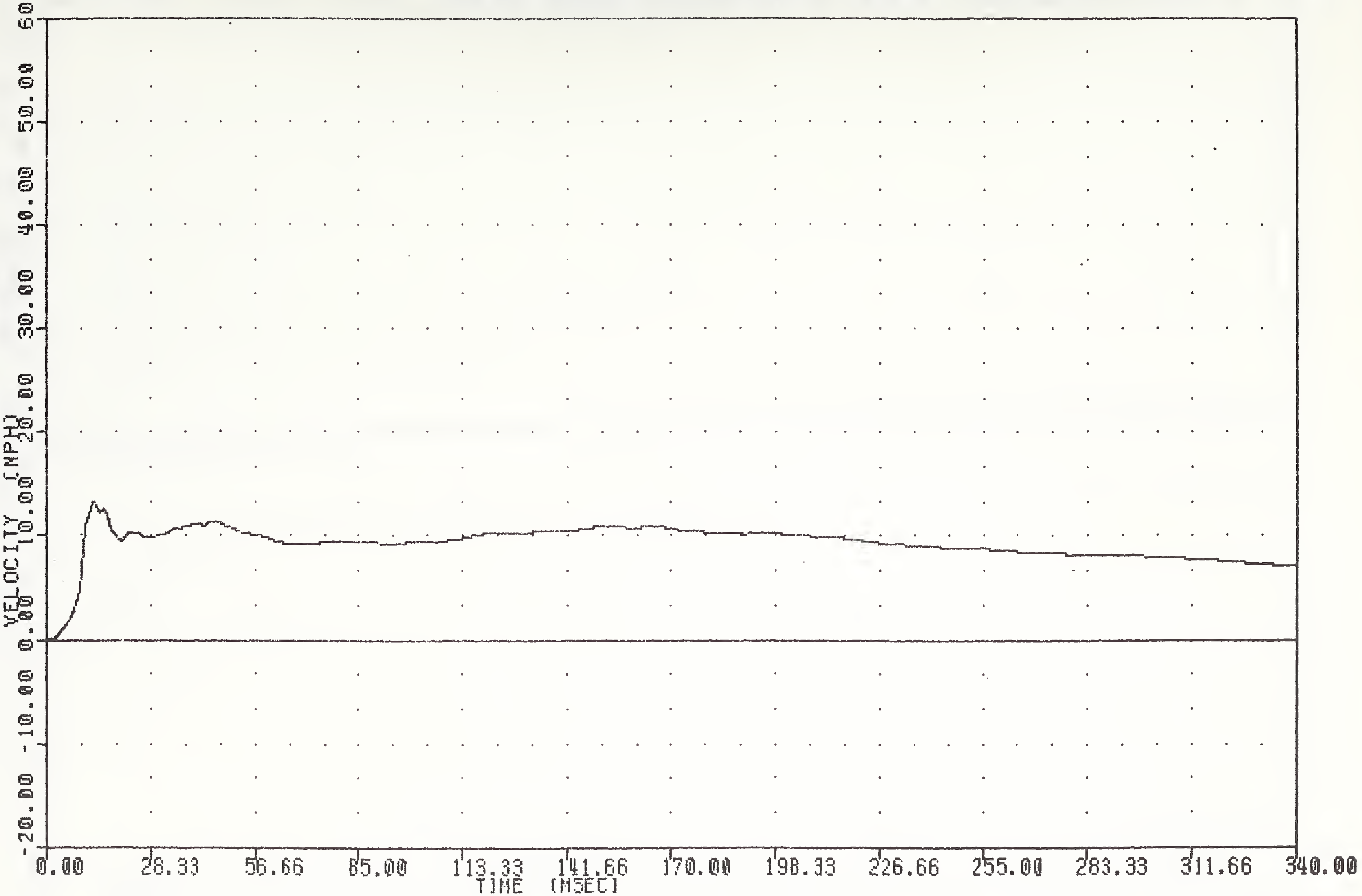
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
VEHICLE CG X-AXIS VELOCITY (PERPENDICULAR TO IMPACT DIRECTION)

```
900925-1      . TRC
CRASH III DAMAGE ALGORITHM
90268                              FILTER = BLPF    300/  750/ -16
VCGYV1                             MIN, MAX VALUES =    -13.19@     12.63 ,      0.00 @     0.00
```



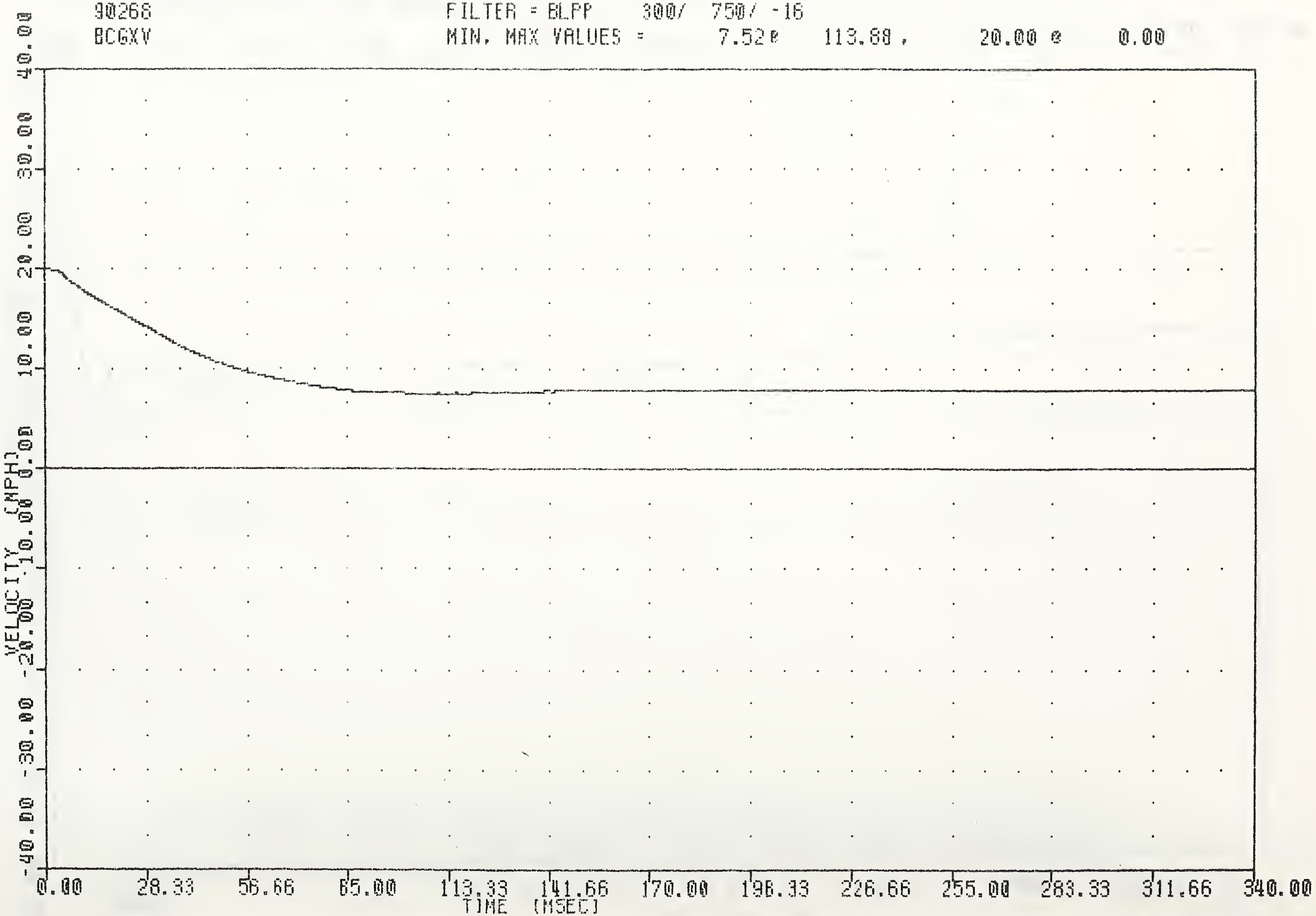
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
VEHICLE CG Y-AXIS VELOCITY (IMPACT DIRECTION)

900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPF 300/ 750/ -16
VCGRV1 MIN, MAX VALUES = 0.00 @ 0.00 , 13.28 @ 12.63



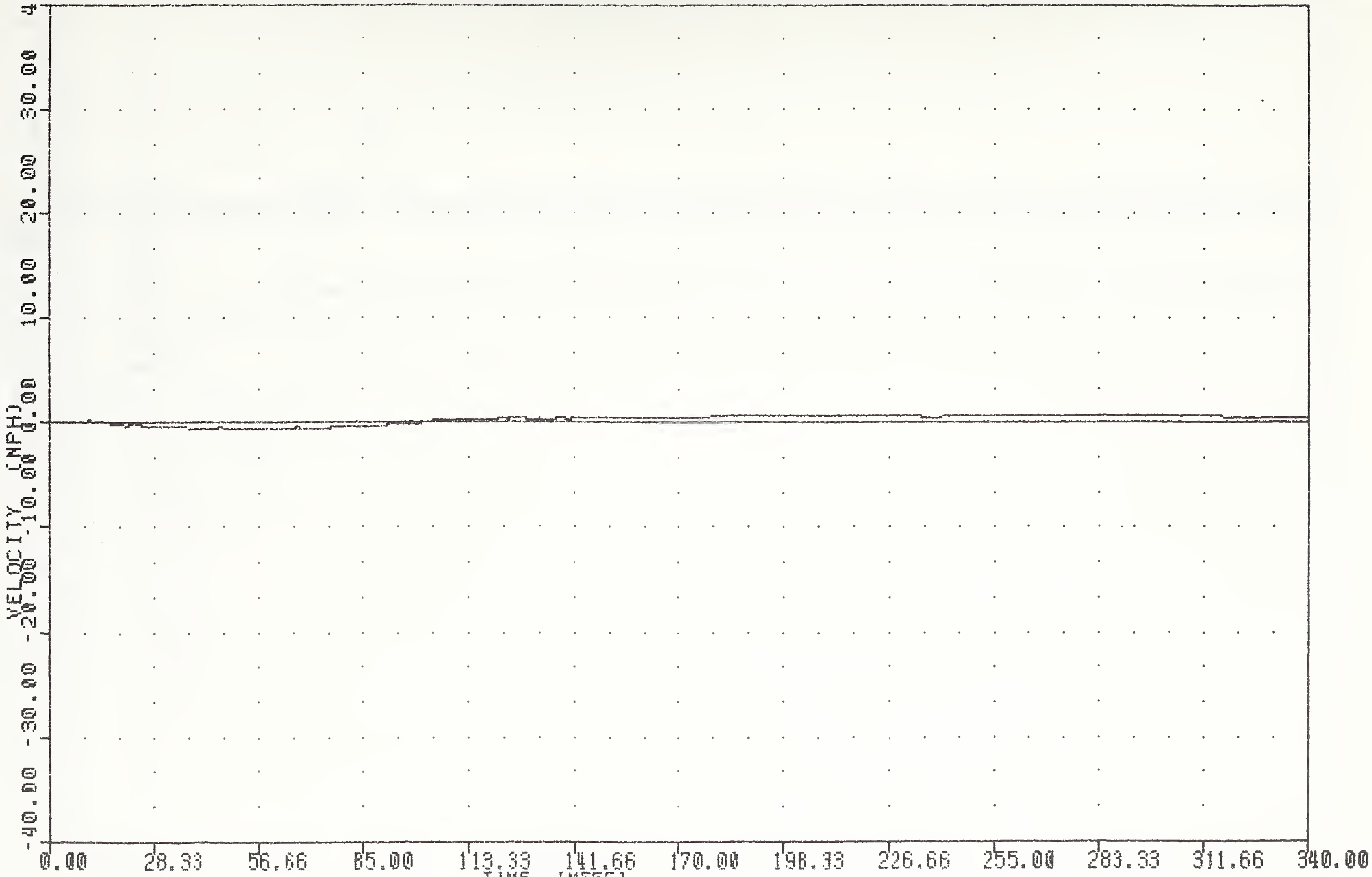
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
VEHICLE CG RESULTANT VELOCITY

900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPP 300/ 750/ -16
BCGXV MIN, MAX VALUES = 7.52 @ 113.88 , 20.00 @ 0.00



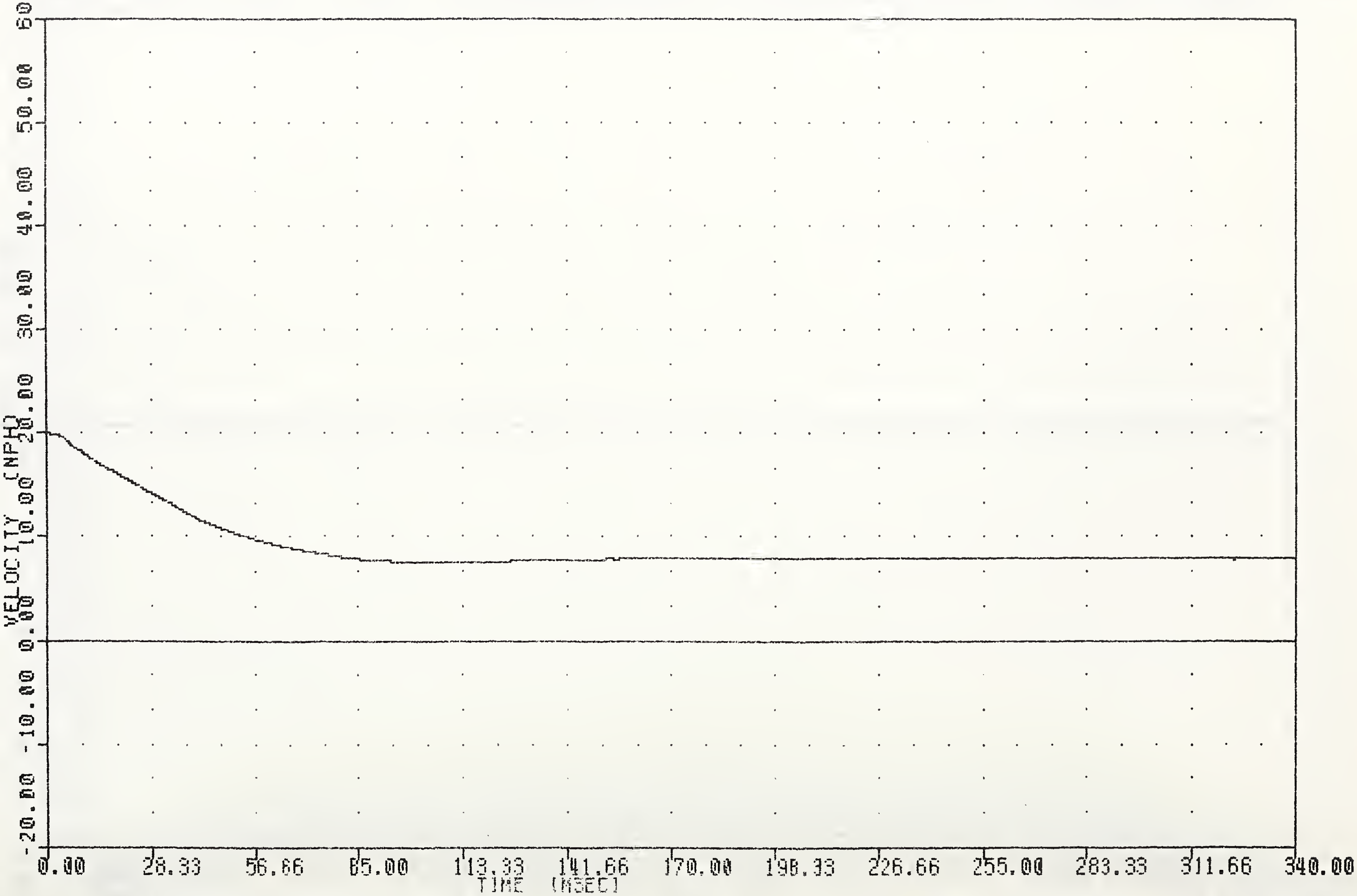
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
MOVING BARRIER CENTER OF GRAVITY X-AXIS VELOCITY

900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPF 300/ 750/ -16
BCGYV MIN, MAX VALUES = -0.62 @ 53.63 , 0.72 @ 277.38



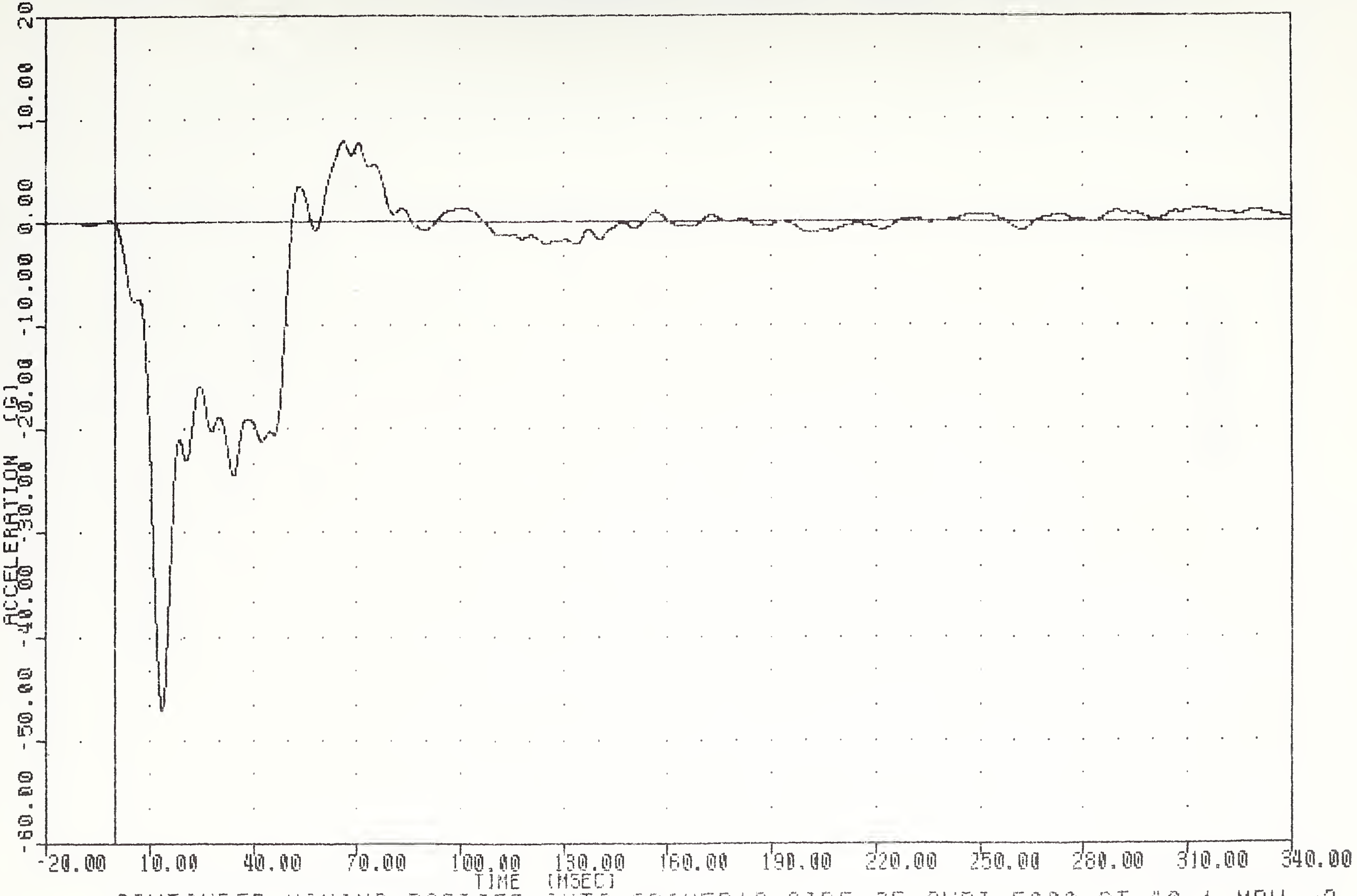
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
MOVING BARRIER CENTER OF GRAVITY Y-AXIS VELOCITY

900925-1 , TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPF 300/ 750/ -16
BCGRV MIN, MAX VALUES = 7.53@ 113.88 , 20.00 @ 0.00



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 20.0 MPH #1
MOVING BARRIER CENTER OF GRAVITY RESULTANT VELOCITY

900925-2 . TRC
CRASH III DAMAGE ALGORITHN
90268 FILTER = SLPF 100/ 250/ -16
AFSYG1 MIN, MAX VALUES = -47.13@ 13.63 , 7.78 @ 66.25

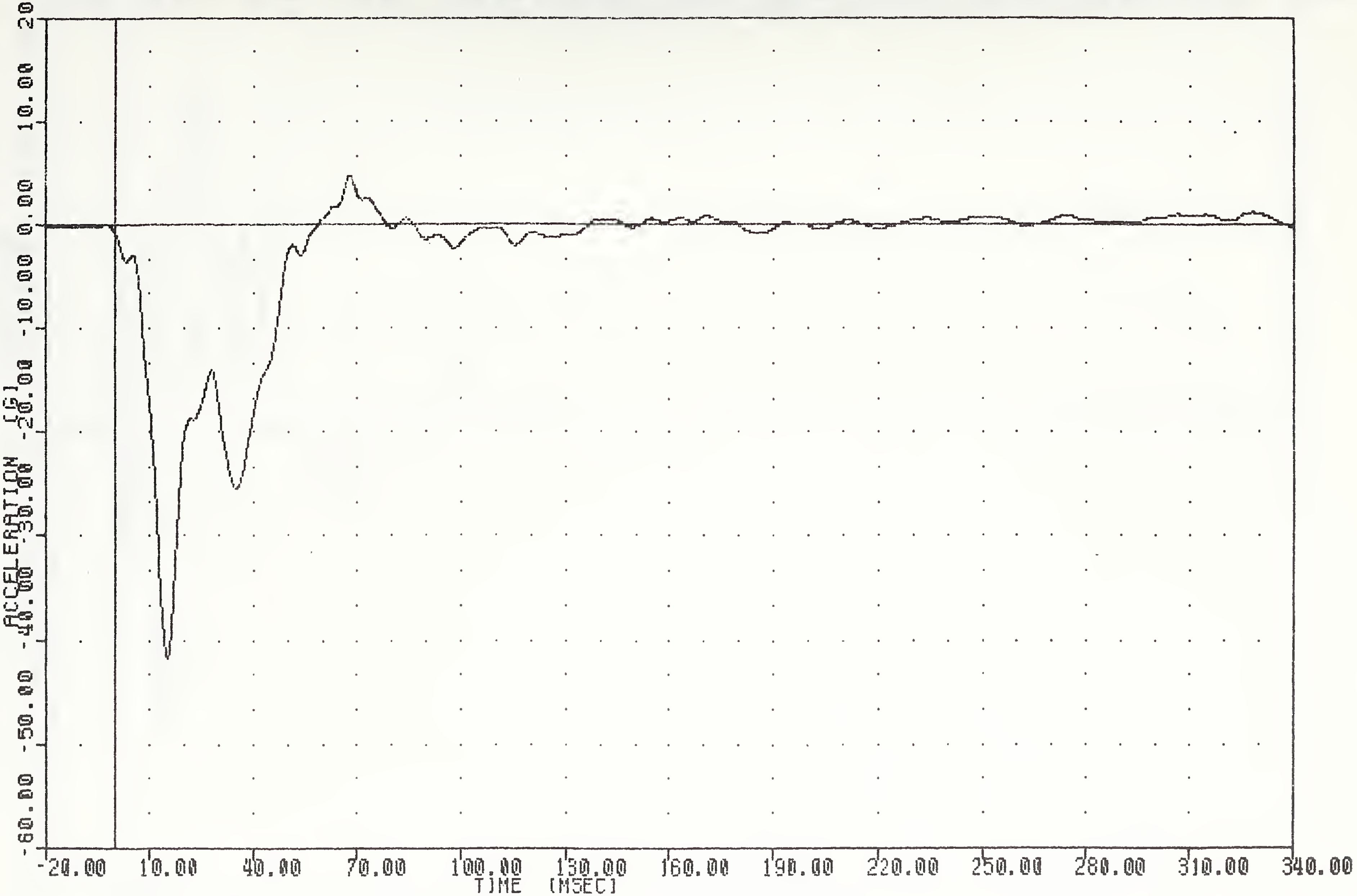


CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
RIGHT FRONT SILL Y-AXIS ACCELERATION

TEST #900925-2

900925-2 , TRC
CRASH III DAMAGE ALGORITHM
90268
ARSYG1

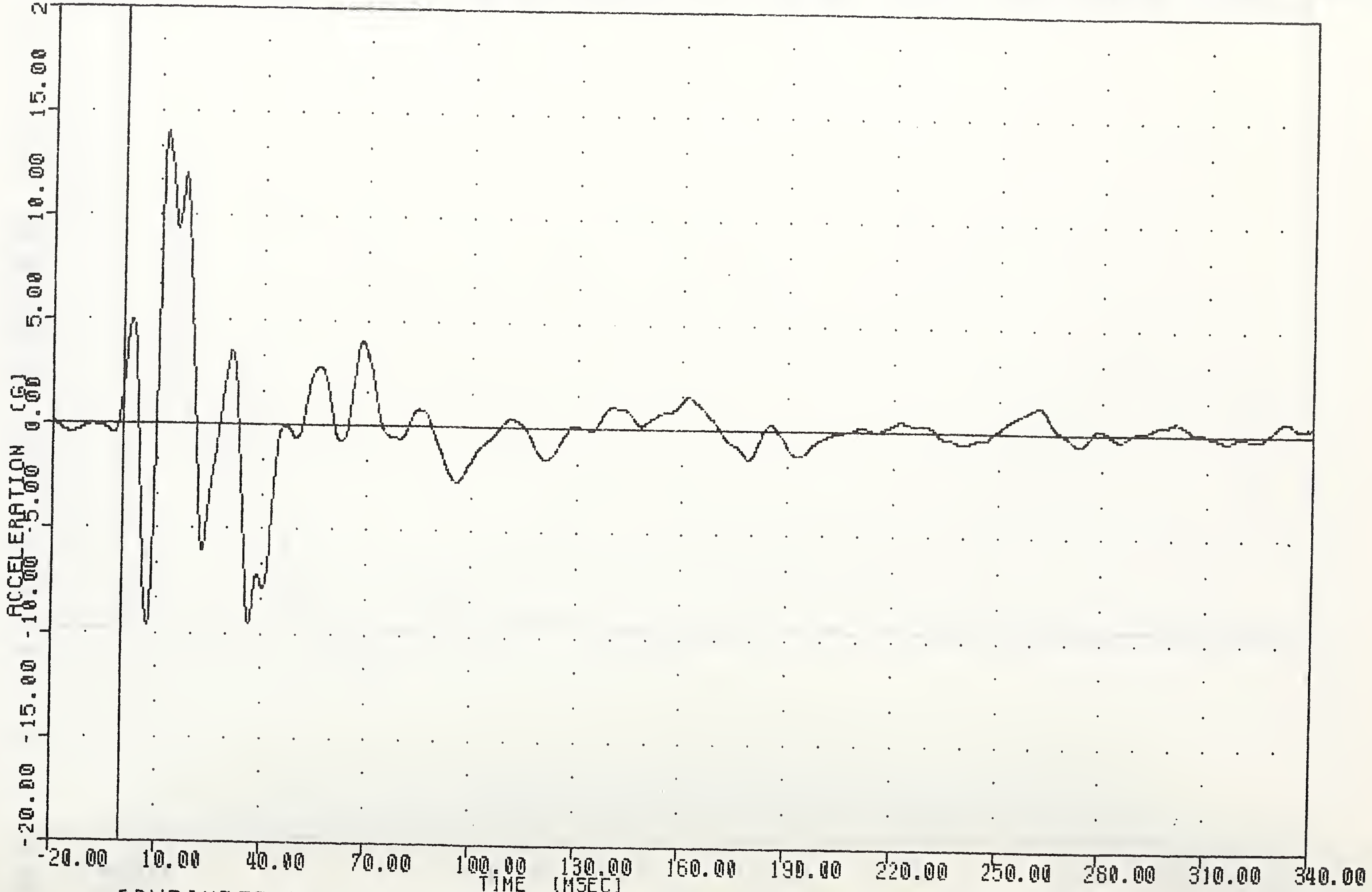
FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -41.77 @ 15.25 , 4.71 @ 67.75



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
RIGHT REAR SILL Y-AXIS ACCELERATION

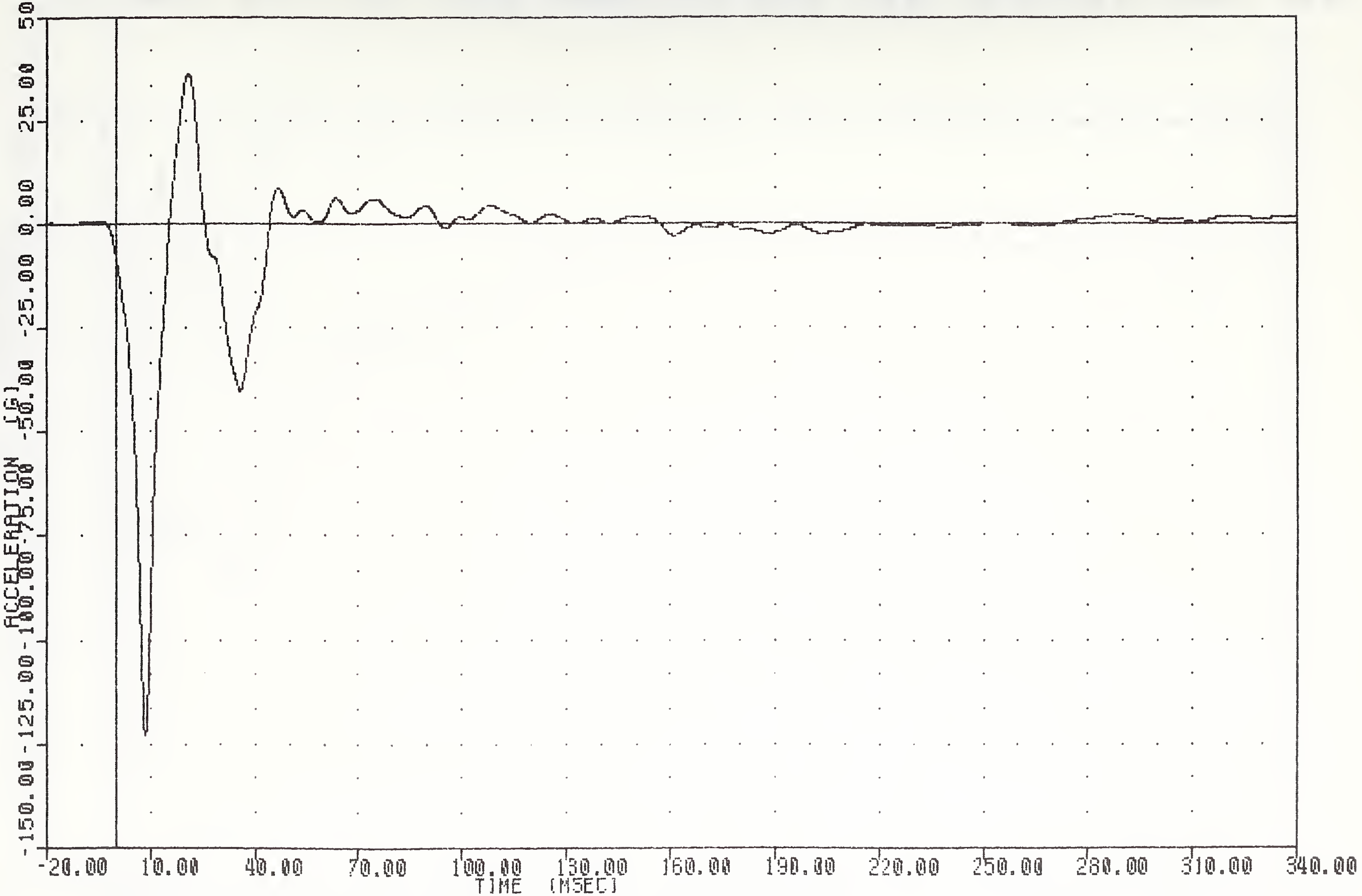
900925-2 . TRC
CRASH III DAMAGE ALGORITHN
90268
VCGXG1

FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = -9.60 @ 7.25 , 13.97 @ 11.88

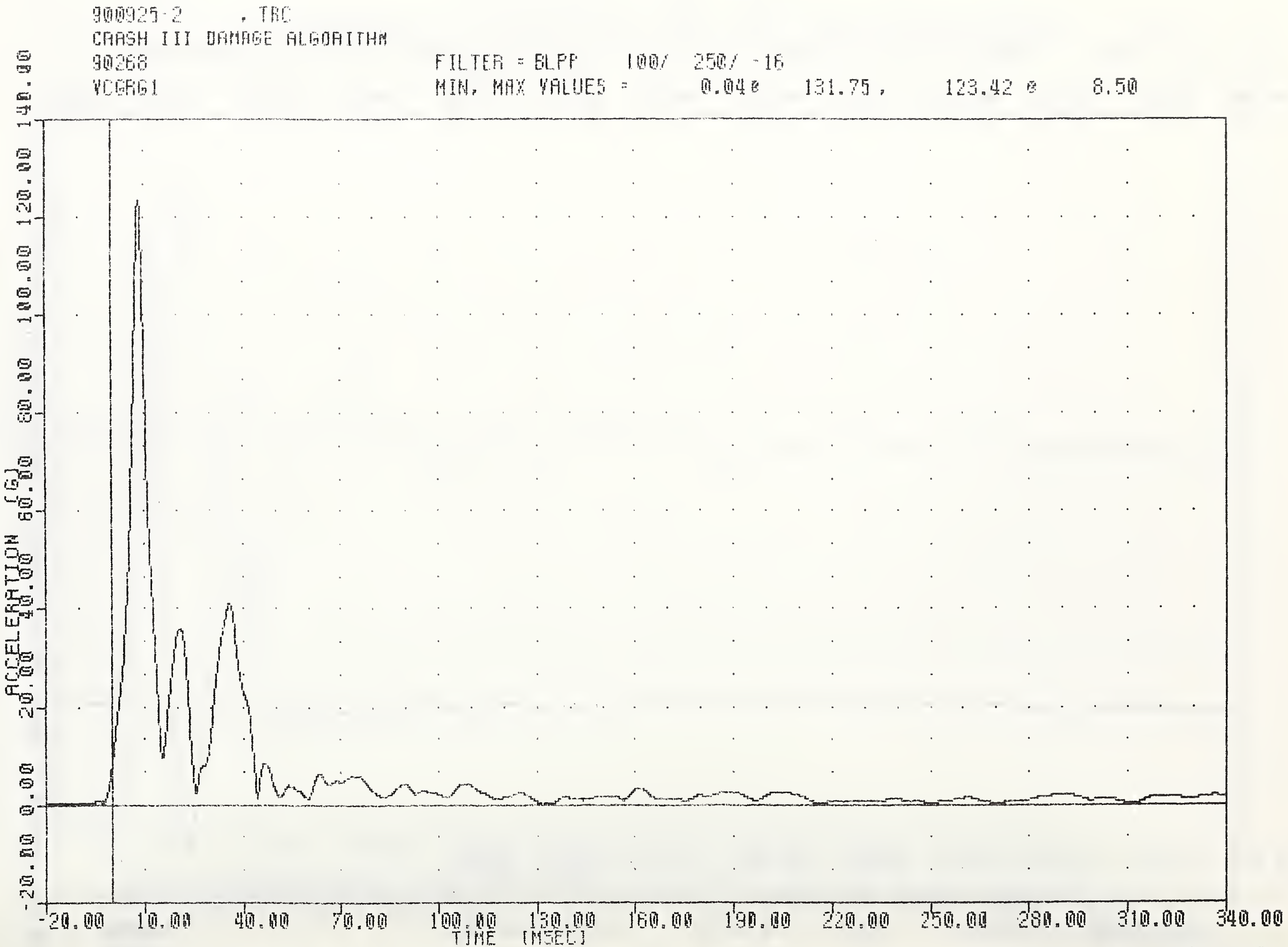


CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
VEHICLE CG X-AXIS ACCELERATION (PERPENDICULAR TO IMPACT DIRECTION)

900925-2 . TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPP 100/ 250/ -16
VCGYG1 MIN, MAX VALUES = -123.24 @ 8.50 , 35.98 @ 20.75



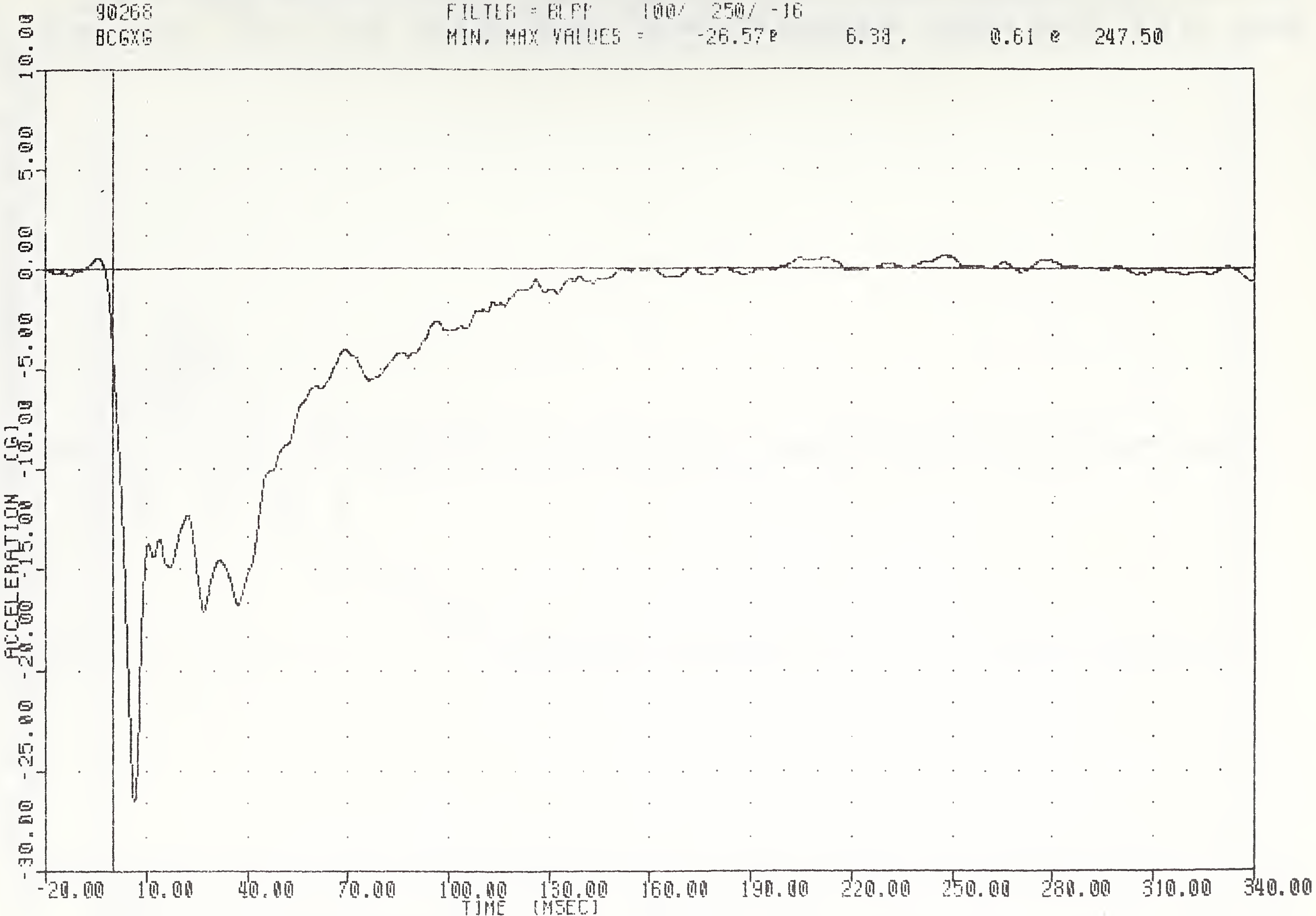
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
VEHICLE CG Y-AXIS ACCELERATION (IMPACT DIRECTION)



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2

VEHICLE CG RESULTANT ACCELERATION

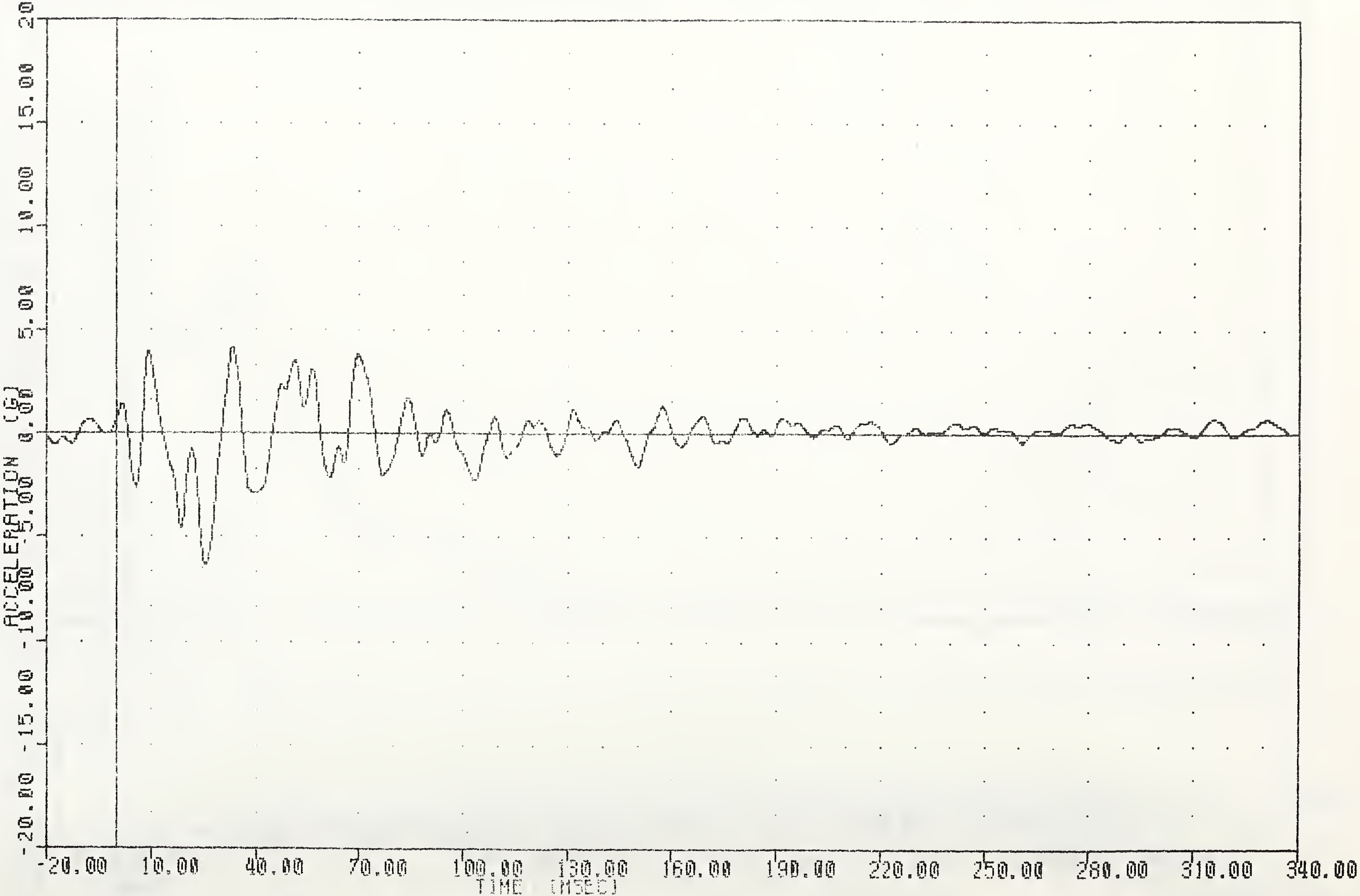
900925-2 , TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPF 100/ 250/ -16
BCGXG MIN, MAX VALUES = -26.57 @ 6.38 , 0.61 @ 247.50



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
MOVING BARRIER CENTER OF GRAVITY X-AXIS ACCELERATION

900925-2 , TRC
CRASH III DAMAGE ALGORITHM
90268
BCGYG

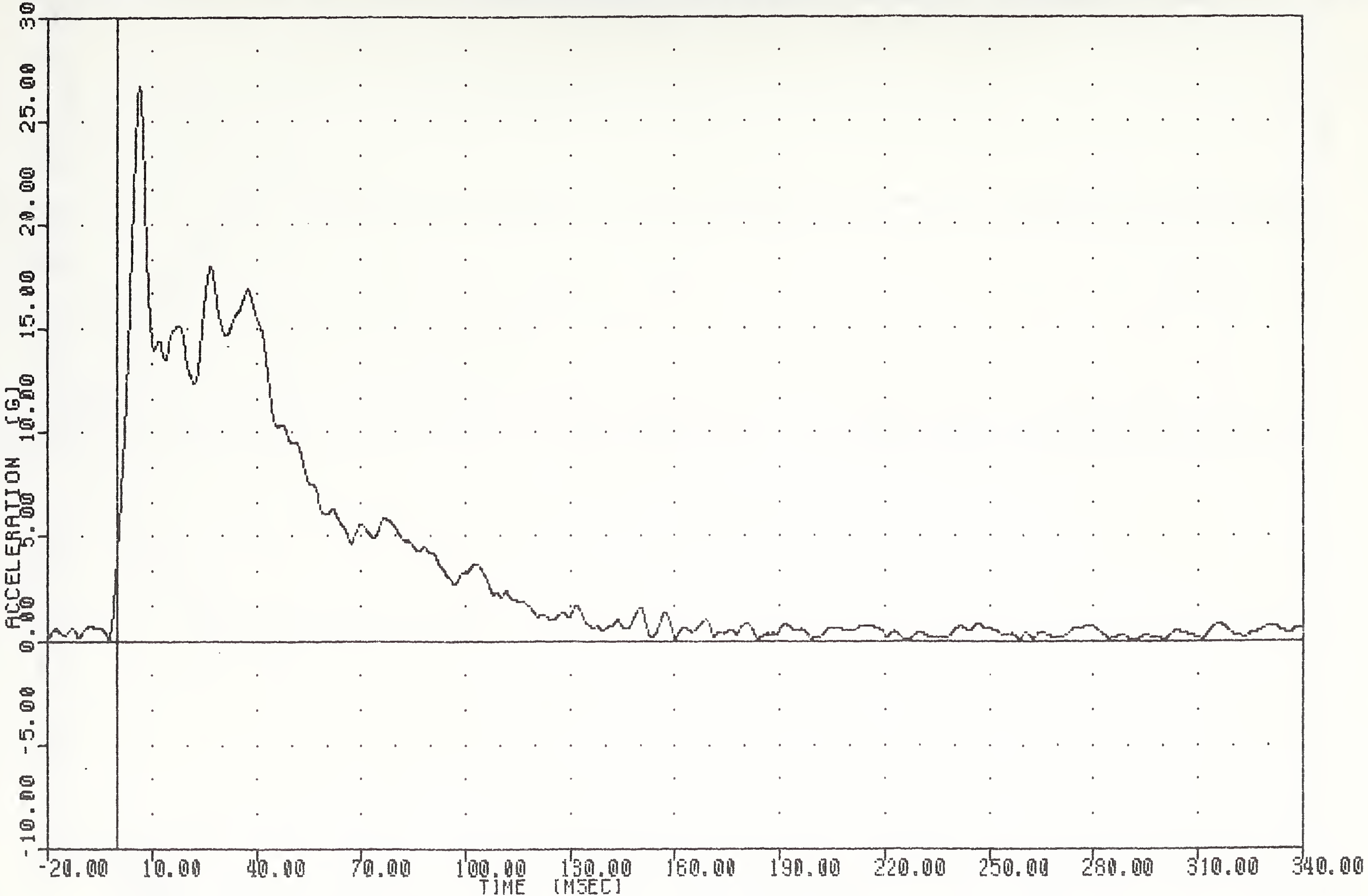
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -6.32 @ 25.63 , 4.20 @ 33.38



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
MOVING BARRIER CENTER OF GRAVITY Y-AXIS ACCELERATION

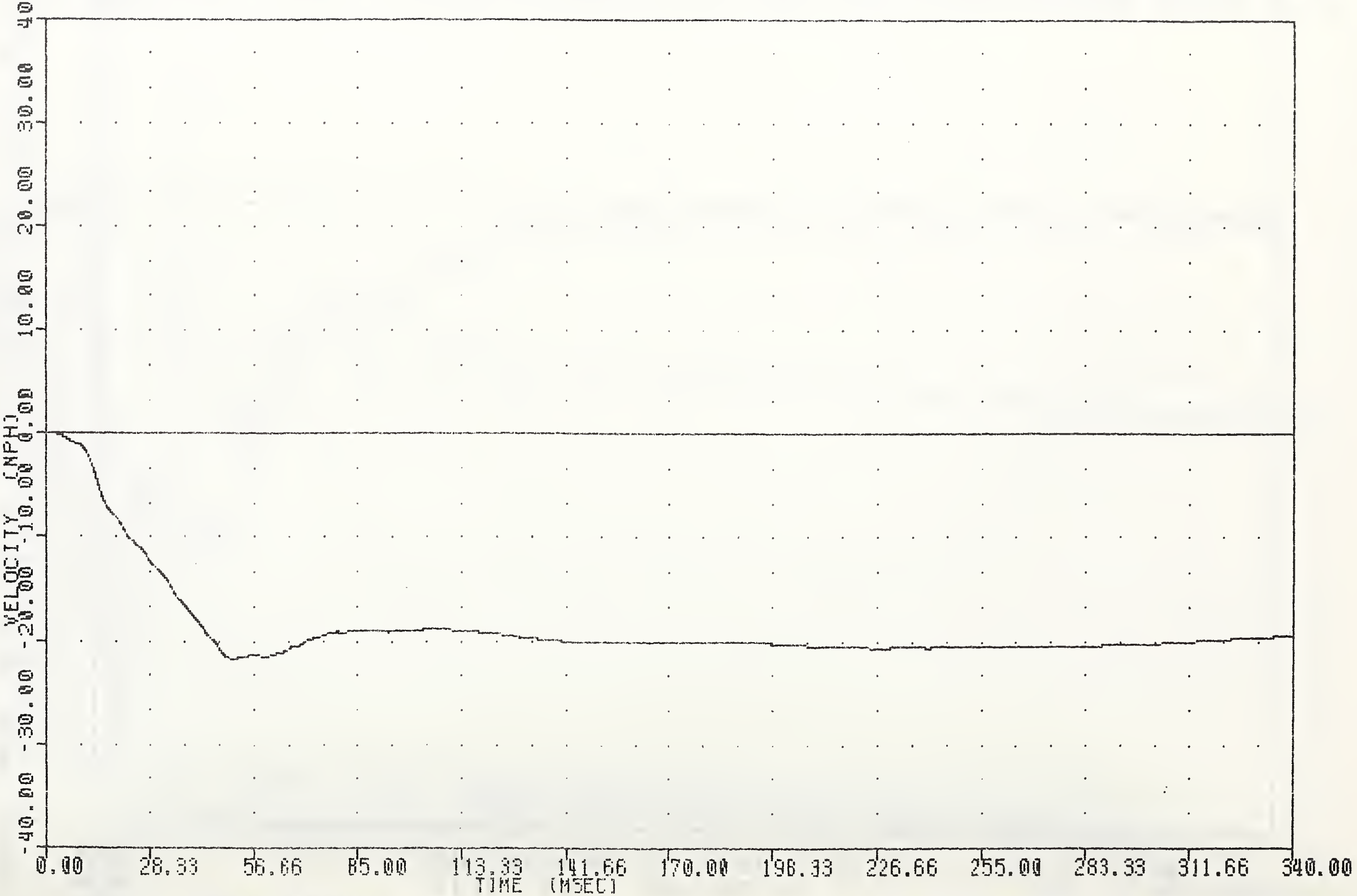
900925-2 , TRC
CRASH III DAMAGE ALGORITHN
90268
BCGRG

FILTER = BLPF 100/ 250/ -16
MIN, MAX VALUES = 0.01 @ 292.63 , 26.64 @ 6.38



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
MOVING BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION

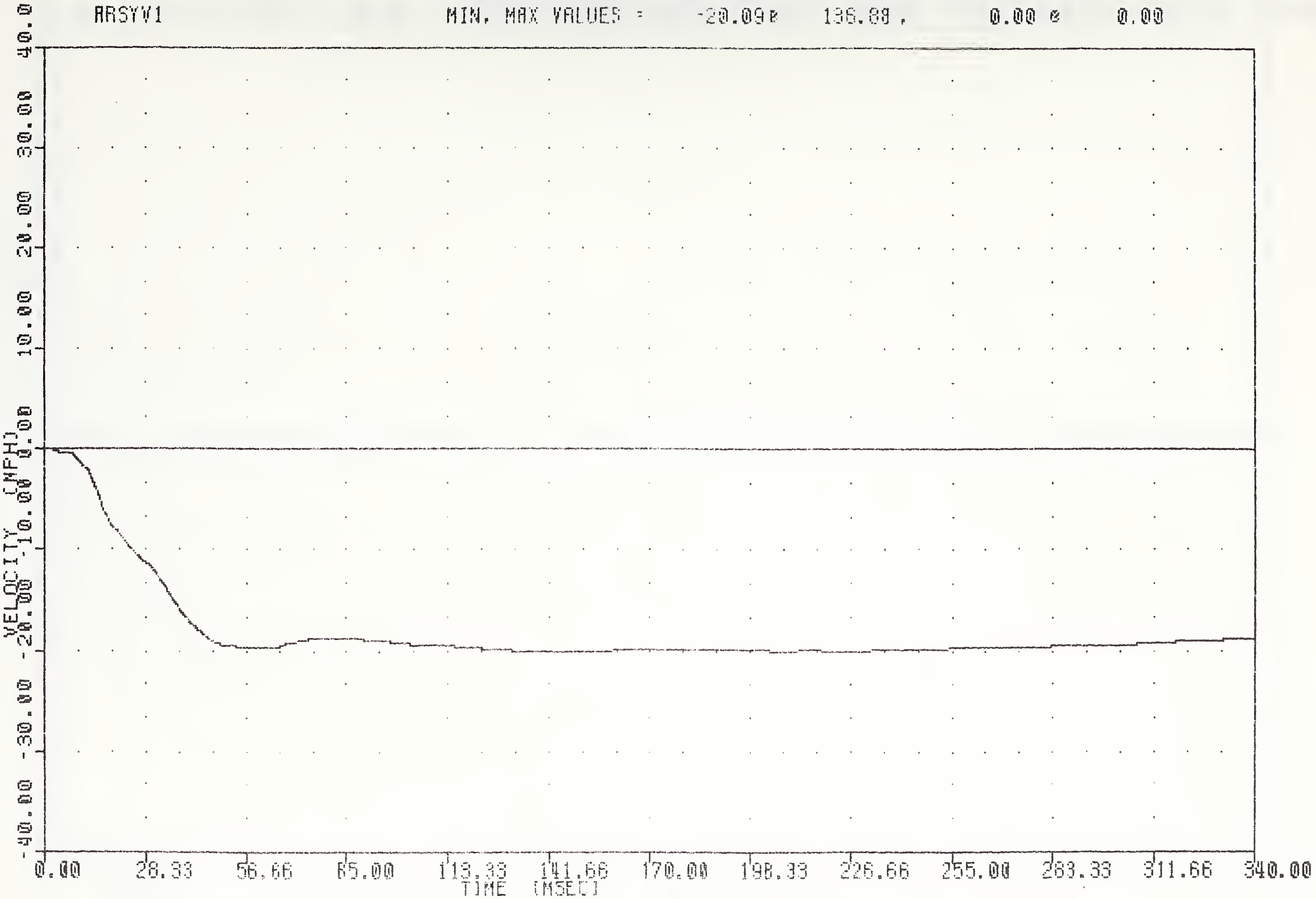
900925-2 , TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPF 300/ 750/ -16
RFSYV1 MIN, MAX VALUES = -21.75 @ 51.13 , 0.00 @ 1.50



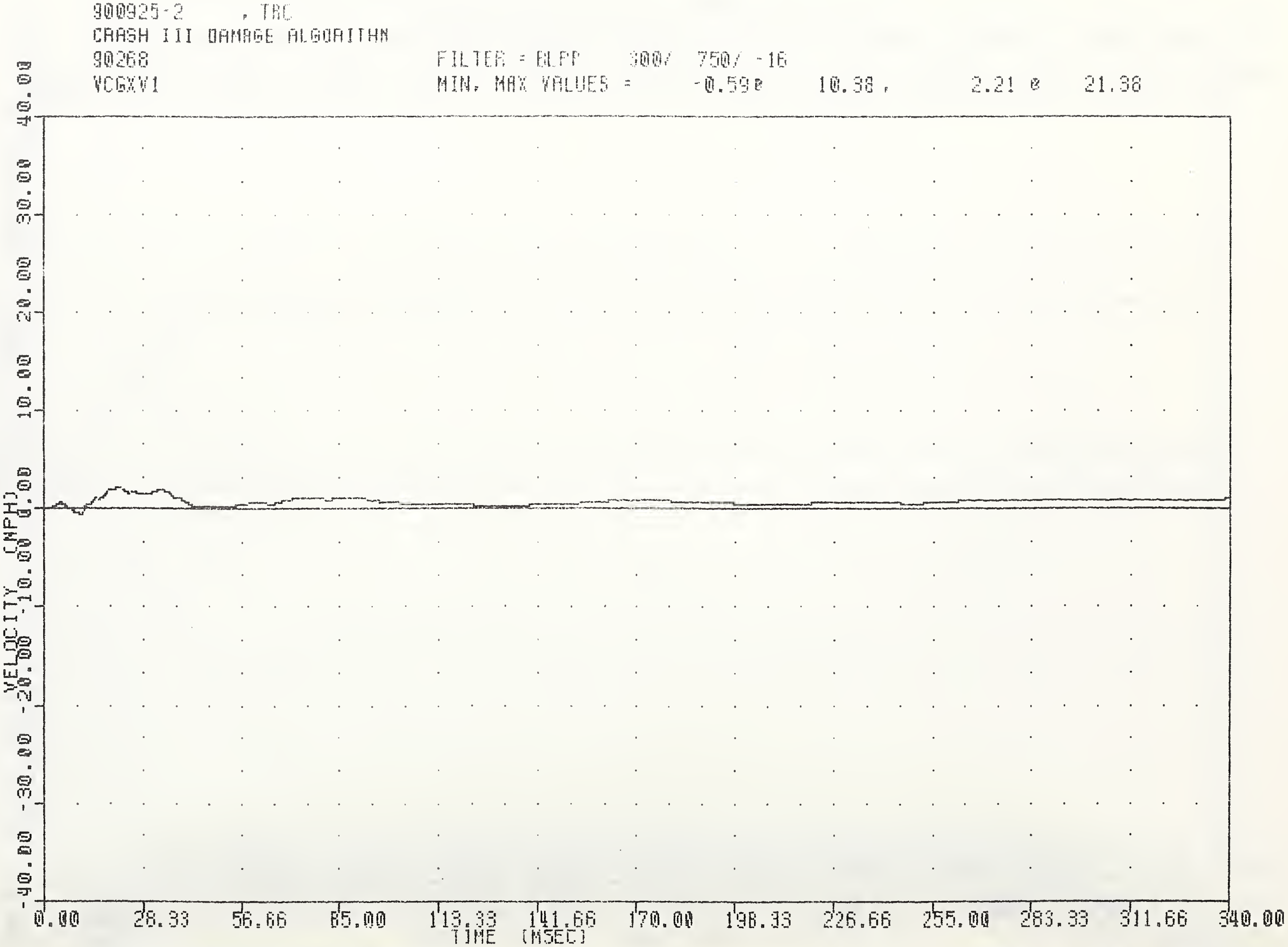
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
RIGHT FRONT SILL Y-AXIS VELOCITY

900925-2 , TRC
CRASH III DAMAGE ALGORITHN
90268
ARSYV1

FILTER = BLPF 300/ 750/ -16
MIN. MAX VALUES = -20.09 @ 136.88 , 0.00 @ 0.00

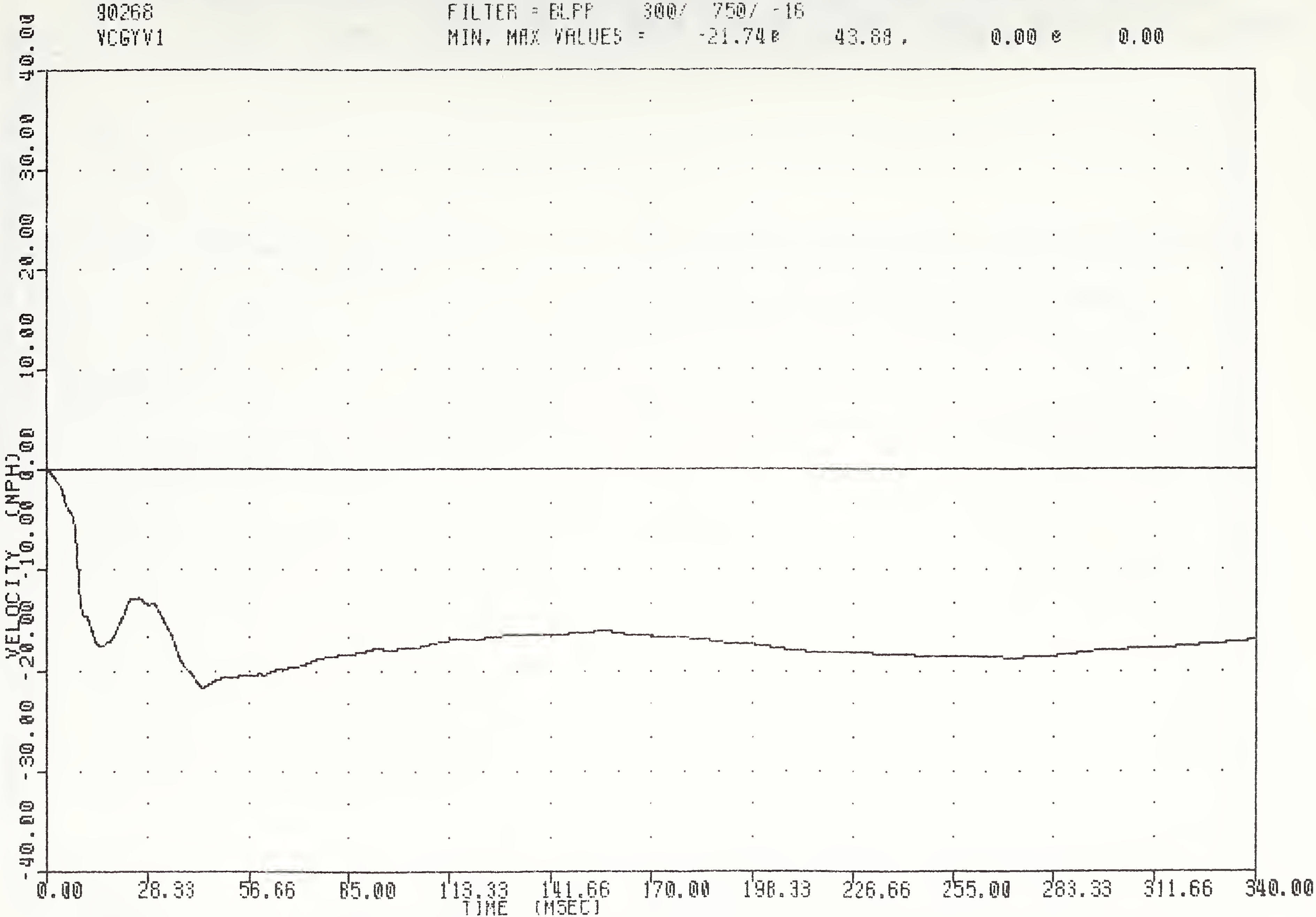


CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
RIGHT REAR SILL Y-AXIS VELOCITY



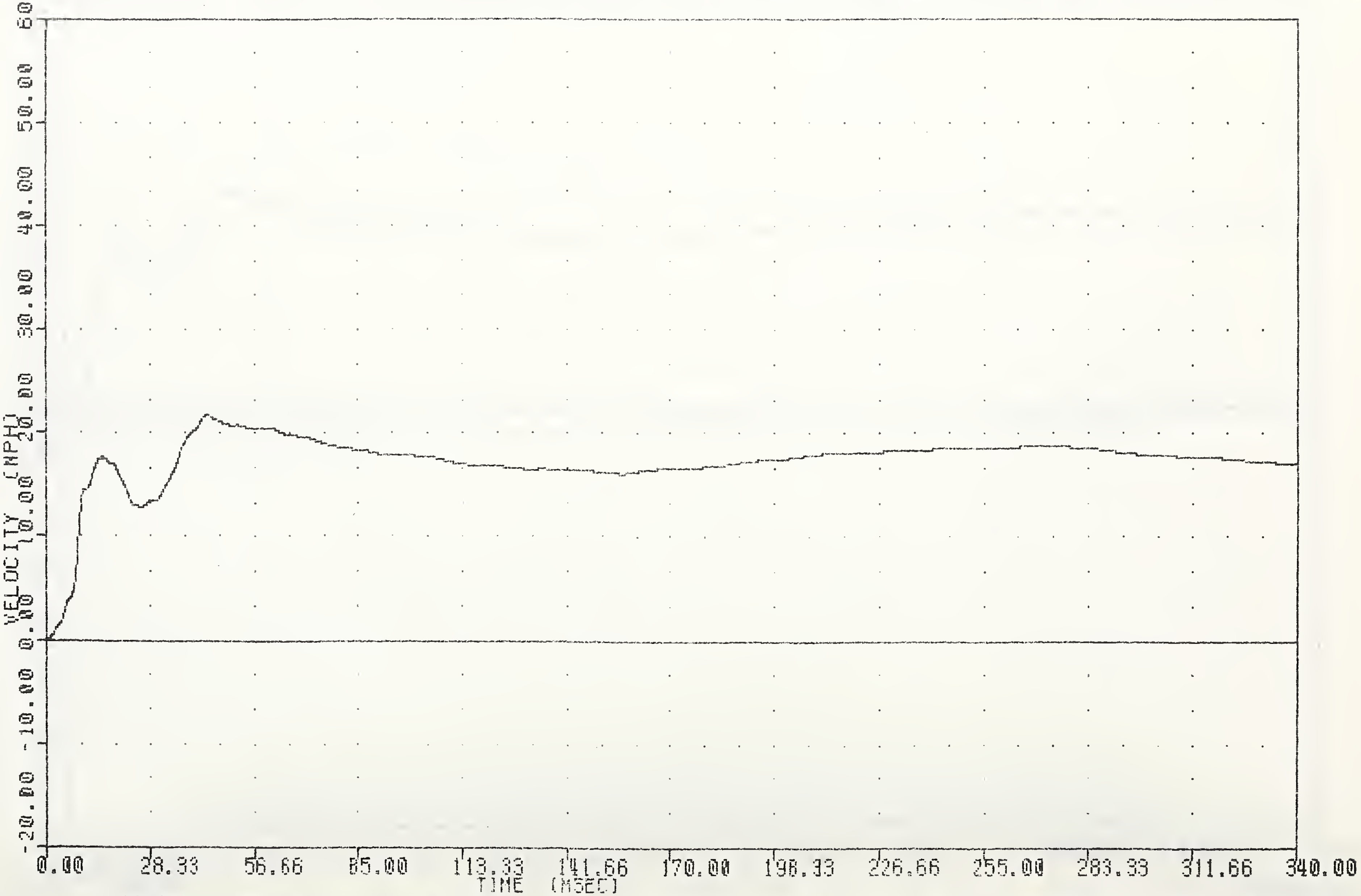
CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
VEHICLE CG X-AXIS VELOCITY (PERPENDICULAR TO IMPACT DIRECTION)

900925-2 , TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPF 300/ 750/ -16
VCGYV1 MIN, MAX VALUES = -21.74 @ 43.88 , 0.00 @ 0.00



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
VEHICLE CG Y-AXIS VELOCITY (IMPACT DIRECTION)

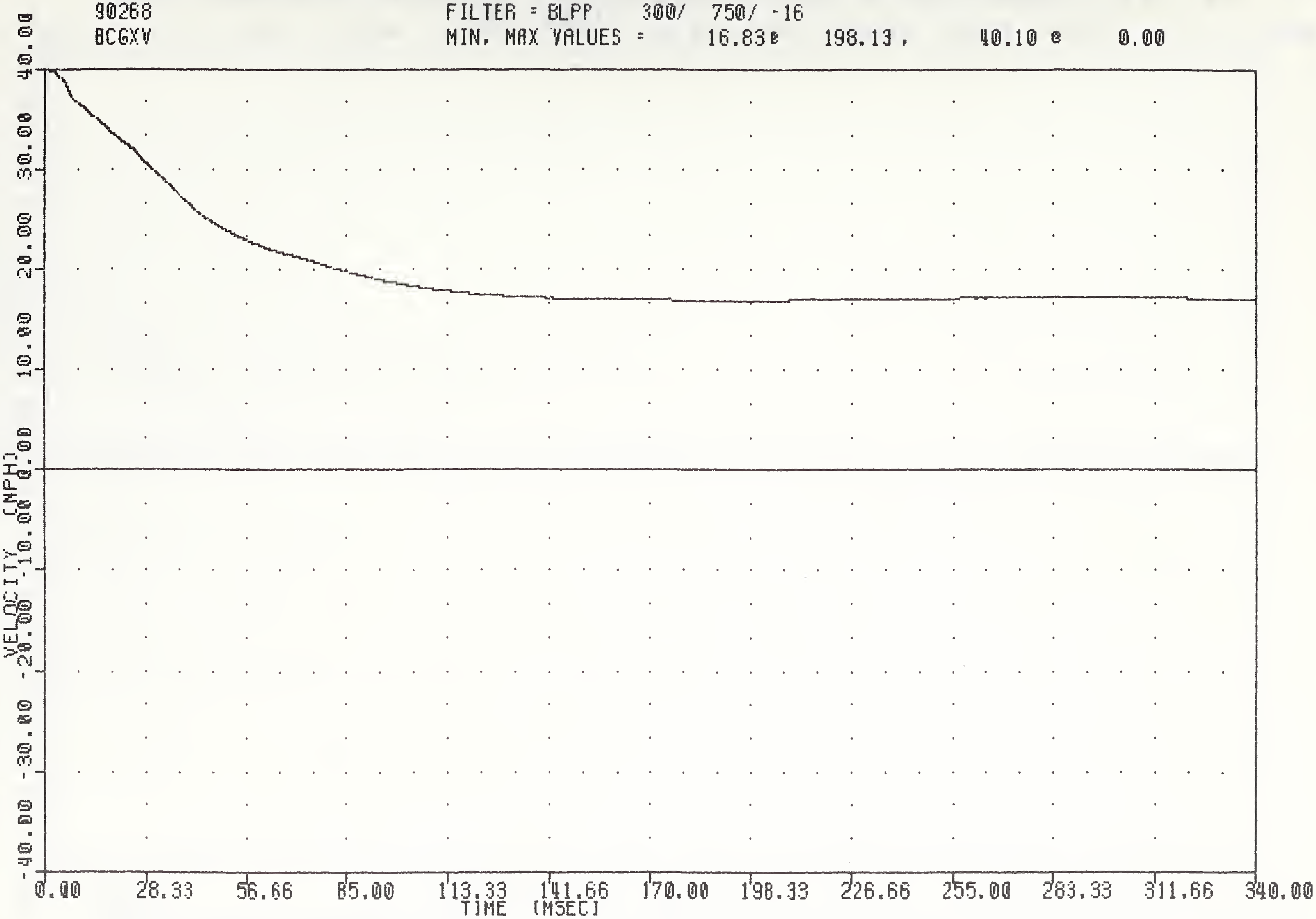
900925-2 , INC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPP 300/ 750/ -16
VCGRV1 MIN, MAX VALUES = 0.00@ 0.00 , 21.74 @ 43.88



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
VEHICLE CG RESULTANT VELOCITY

900925-2 , TRC
CRASH III DAMAGE ALGORITHN
90268
BCGXV

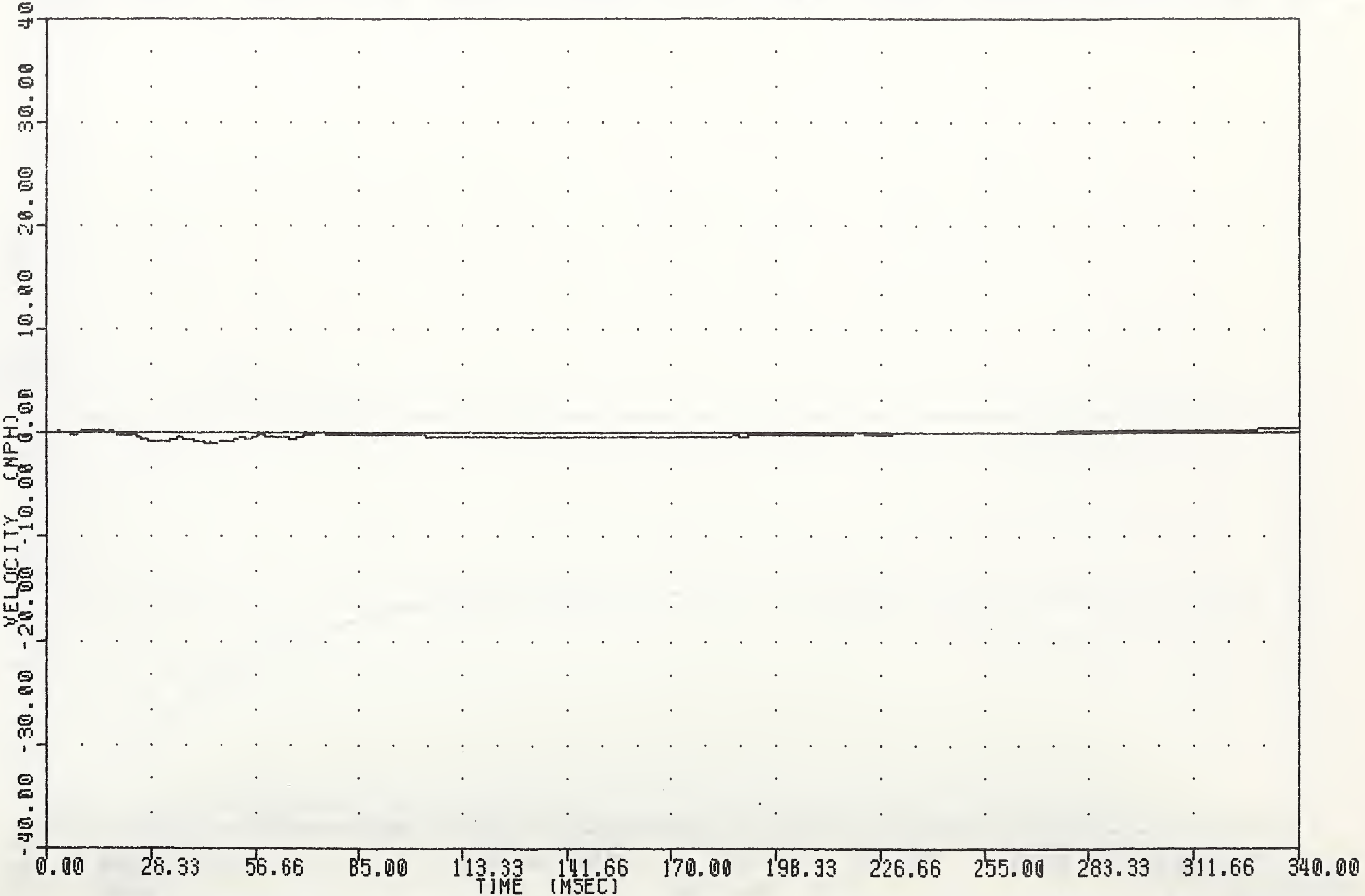
FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = 16.83 @ 198.13 , 40.10 @ 0.00



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
MOVING BARRIER CENTER OF GRAVITY X-AXIS VELOCITY

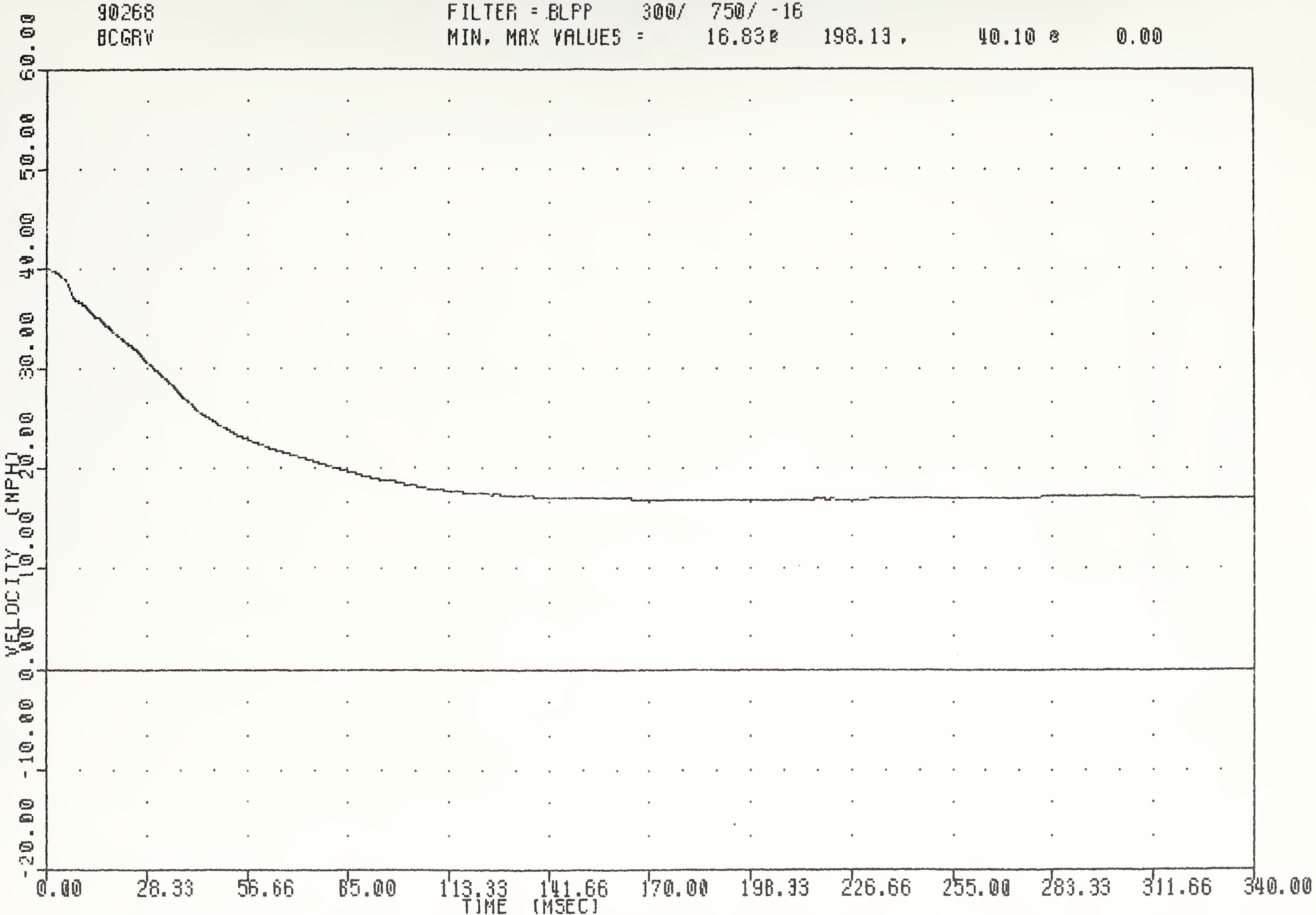
900925-2 . TRC
CRASH III DAMAGE ALGORITHN
90268
BCGYV

FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = -0.94 @ 45.25 , 0.48 @ 340.00



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
MOVING BARRIER CENTER OF GRAVITY Y-AXIS VELOCITY

900925-2 , TRC
CRASH III DAMAGE ALGORITHM
90268 FILTER = BLPP 300/ 750/ -16
BCGRV MIN, MAX VALUES = 16.83 @ 198.13 , 40.10 @ 0.00



CONTOURED MOVING BARRIER INTO DRIVER'S SIDE OF AUDI 5000 AT 40.1 MPH #2
MOVING BARRIER CENTER OF GRAVITY RESULTANT VELOCITY

APPENDIX C

MISCELLANEOUS TEST INFORMATION

VEHICLE ACCELEROMETER INFORMATION

NO.	LOCATION	AXIS	MFR	MODEL	S/N	ORIENTATION (+ SENSING)
1	RIGHT FRONT SILL	Y	ENDEVCO	7264	CF111	LEFT
2	RIGHT REAR SILL	Y	ENDEVCO	7264	CB25H	LEFT
3	VEHICLE CENTER/GRAVITY	X	ENDEVCO	7264	CL73H	REAR
	VEHICLE CENTER/GRAVITY	Y	ENDEVCO	7264	CJ34H	RIGHT

SIGN CONVENTION

ALL DUMMY, BARRIER AND VEHICLE CHANNELS:

+X: FORWARD

+Y: LEFTWARD

+Z: UPWARD

+FORCE: TENSION

MOVING BARRIER ACCELEROMETER INFORMATION

NO.	LOCATION	AXIS	MFR	MODEL	S/N	ORIENTATION (+ SENSING)
1	MOVING BARRIER CENTER OF GRAVITY	X	ENDEVCO	7264	CF93H	FORWARD
	MOVING BARRIER CENTER OF GRAVITY	Y	ENDEVCO	7264	CJ04H	LEFT

*U.S. GOVERNMENT PRINTING OFFICE: 1991--617-815/41091

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El-Habash, N

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